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The Emu

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of Native Birds.

Official Organ of the ROYAL AUSTRALASIAN ORNITHOLOGISTS' UNION.



Editors { A. J. CAMPBELL, Col. Mem. B.O.U.
CHARLES BARRETT.

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"Birds of a feather."

VOL. XII.]

1ST JULY, 1912.

[PART I.]

Field Ornithology in South Australia.

BY (CAPT.) S. A. WHITE, R.A.O.U., ADELAIDE.

ON THE EYRE PENINSULA.

LAST season, accompanied by my wife, and at considerable expense and inconvenience, I undertook many ornithological collecting trips, by the special permission of the Government, in the State of South Australia.

Possessing the time and the inclination, I did it primarily to assist Mr. Gregory M. Mathews in the completion of his work on "The Birds of Australia," to whom I have presented the whole of the collections made, and also because I desired to see the State thoroughly explored ornithologically. Since the days of Gould and my father, the late Samuel White, who assisted him, practically nothing has been done, save the expeditions of the R.A.O.U. to Kangaroo Island and Eyre Peninsula respectively.

So far the districts visited by Mrs. White and myself have been the Eyre Peninsula, Port Augusta, the mallee of the Lower Murray, the Lakes, Cape Jervis, and Kangaroo Island. The coming season we hope to take other districts.

The following notes were made on a trip to Eyre Peninsula. We left Adelaide on 22nd August, 1911, and our starting-point was Port Lincoln, where we saw *Trichoglossus nova-hollandiae* in numbers feeding on the mallee blossom. The birds made a great noise, screeching and squabbling over the flowers. *Glossopsittacus porphyriocephalus* were also there, but not in such numbers, and, unlike the last-named species, they went in pairs.

We observed two small parties of *Sericornis maculata* (?) in the thick scrub. These birds, when not alarmed, hop over the dry leaves and stones in a sprightly manner, uttering a low chirping call at intervals. But when alarmed they dart off to cover like a flash, and keep perfectly quiet. It is some time before they regain sufficient confidence to emerge again. Three apparent varieties of these birds came under our notice during this trip, some specimens being extremely light on the forehead, with lores almost white. *Meliornis nova-hollandiae* were in great numbers, uttering their sharp, squeaking notes. These birds nest very early here, for there were many fully-fledged young about. We saw one pair of Painted Quail (*Turnix varia*) in the thick scrub,

and *Zosterops caerulescens* were plentiful, hopping about on the ground in large parties.

Leaving next day for Warunda we formed our camp close to the old camping-place of the R.A.O.U. in 1909. Around the camp birds were fairly numerous. Blue Mountain Parrots (*Trichoglossus novæ-hollandiæ*) were nesting in the sugar gums (*Eucalyptus corynocalyx*), selecting the most inaccessible hollow limbs. The eggs, two in number, were placed on bare wood. Young were covered with soft grey down. No gums being in flower along the creek at this time the birds were feeding on the flowers of a heath-like plant (*Astroloma conostephoides*) which grew close to the ground. They are very noisy birds when nesting. They perch, in pairs or singly, on the limbs close to their nests, screeching and making a great noise.

Strepera fusca was not nearly so numerous as in 1909. We heard only one pair near the camp, and it was some time after we arrived that we discovered a nest placed among the topmost branches of a gum (*Eucalyptus odoratus*). The branch was slender, and the climb a hard one. After many attempts, I had at last to cut the limb and lower it, which took half a day to accomplish. But we were rewarded by a fine clutch of brown eggs, spotted with indistinct blotches of a darker colour. These eggs were more pointed than is usual with this species. I presented the clutch to Mr. H. L. White, of Scone, N.S.W. The nest, unlike those of other birds of the same genus, was neatly lined with dry grass, and was composed of fairly large sticks. The male feeds the female on the nest, and the latter makes the same gurgling and gulping sound as the young Magpie does when being fed. These birds are very wary, and when alarmed will keep just out of gunshot, flying on from tree to tree. Each time a flight is made the bird gives a loud, piping, bell-like call, very clear, yet harsh, and a distinct cry of alarm, at which most other birds and animals take warning. These birds nest, as a rule, very early, this season being somewhat late.

Acanthochæra carunculata was very numerous round our camp. Their peculiar harsh cry and queer calls are kept up from the first streak of dawn till darkness sets in. They are very early nesters, nearly all we saw having fully-fledged young. There were one or two late broods—most likely second ones. Their chief food appears to consist, at this time of the year, of soft, hairy caterpillars.

Pardalotus ornatus was also plentiful. They seemed to keep to the big gum country, and were found constructing their beautifully formed nests of soft bark and grass in the hollow of a gum limb or bole, a hole with a very small entrance being always chosen.

Cuculus pallidus was very numerous. The quaint notes could be heard all over the country. All specimens collected were males, and I firmly believe that the female seldom calls, and not at all at this time of the year.

Cacomantis flabelliformis was also numerous. In the early mornings and evenings the birds perched upon the loftiest branch of a dead gum, calling incessantly for hours.

Ptilotis ornata was numerous in the sugar gums. The habits and many of the notes of this species resembled those of *Ptilotis penicillata*.

Sittella pileata was thinly dispersed over the country. Few were observed, and they drew attention by their chattering note while on the wing.

Ptilotis cratitia.—We saw but few specimens. They seemed to prefer the low scrub country to the timber.

Sericornis maculata we found in the thick broom country and in the undergrowth on the creek-bank. Shot one in the last-named locality which was of a distinct rufous tinge.

Podargus strigoides.—We saw very few. They were numerous when we were here before. They sit motionless in the scrub. A favourite resting-place during the daytime is at the foot of a tree, close to the trunk. We often heard the strange "mooing" call at night near the camp.

Burhinus grallarius.—A few were heard round the camp at night, and a pair of eggs was discovered on a bare patch of ground.

Smicrornis brevirostris.—In evidence both in the timber and low scrub. The first thing that strikes one in connection with this species is that it possesses a loud note for so small a bird. They seem to be always on the move among the foliage, searching for insects.

Pachycephala rufiventris.—Met with in pairs here and there in the scrub and in the open timber close to the scrub. The song was almost equal to that of the White-throated variety. They had not started to build at the time of our visit. We found several nests here in October, 1909.

Uroaetus audax.—A few pairs were about. Took a clutch of two eggs, well marked, from a nest which contained a single egg in 1909. A mile or so away we took another clutch, one egg very pale in comparison with the other. Flushed a bird from its nest in a big red gum in the ranges, and found a single egg, well incubated.

Collyriocincla rufiventris.—These birds were fairly plentiful along the creek. Habits seemed identical with those of *C. harmonica*. We do not think that they have so liquid and pleasing a note as the eastern bird.

Micræca fascians.—A few of these small birds were seen sitting upon the dead branches, watching for insects, or sallying out at intervals to catch their prey.

Malurus cyaneus.—Plentiful in damp localities, moving about in small parties with rarely more than one male in adult or nuptial plumage. Sometimes one or more half-plumed males, and males in brown plumage, were seen with several females. All the males do not take on a brown plumage in the winter.

Sisura iniquita.—A few of these birds were met with in the

district, and we learned that they only make the strange grinding sound when hovering over the ground.

Rhipidura tricolor.—Not plentiful. A pair here and there, always on the look-out for winged insects.

Acanthiza pyrrhopygia.—These little birds were seen everywhere—in the open timber and the thick scrub alike—moving over and under fallen timber and through the scrub with great rapidity, uttering a sharp twittering note the while.

Gymnorhina leuconota.—Seen in open country during the day-time. Resorted to the timber to roost at night. Birds roosting near the camp could be heard singing at intervals all through the night.

Cerchneis cenchroides.—We saw one or two of these useful birds near the creek, generally perched on a dead bough or hovering over the ground.

Ninox boobook.—We heard this bird call at night near the camp, but did not see it during the daytime.

Corone australis.—Observed at the creek and along the west coast. During the latter part of our journey found them nesting.

Artamus tenebrosus.—All through the country. They were just building.

Eopsaltria gularis.—Met with in the scrub, but nowhere plentiful. They had not started to nest at the time of our visit. Until nesting begins they are very silent.

Pomatorhinus superciliosus.—These birds were scattered over the country in small parties. Their activity when in a bush or on the ground was marvellous. They passed over the ground in a succession of hops, turning over leaves, bark, and manure in search of insect life.

Barnardius zonarius.—Not nearly so plentiful as in 1909. A few pairs were met with in the sugar gums, and it was not till the first week in September that they showed signs of nesting. They began by peering into hollow limbs and clearing out the decayed wood, chattering all the while, and wagging their outspread tails violently.

Phaps chalcoptera.—Saw one specimen. It was flushed from the ground, and flew into a big gum.

Cheramæca leucosternum.—We found a pair of these birds nesting in the high bank of the creek. The nest was lined with fine rootlets and leaves, but no eggs had been laid.

Melithreptus brevirostris.—These birds were in numbers, generally moving about in small flocks, feeding among the low flowering shrubs, chiefly *Astroloma conostephoides*.

Glycyphila melanops.—A fair number of these birds was met with at Warunda Creek—in the low bush outside the timber belt on the creek. We found two or three nests, mostly containing young.

On 28th September we struck camp for the west coast, passing over undulating sandy country covered with low scrub, principally *Eucalyptus incrassata*, *Casuarina distyla*, *Grevillea ilici-*

folia, and many bright-flowered shrubs, including *Bækea crassifolia*.

Glycyphila melanops was very abundant in this country.

Pardalotus xanthopygius.—This species takes the place of *P. ornata*, which seems to keep to the larger timber, in which they nest; while *P. xanthopygius* frequents the low scrub and nests in the soft soil.

Considering the large patches of banksia in blossom, we wondered at the absence of honey-eating birds. A few *Smicrornis brevirostris* were met with here. An odd pair of *Graucalus melanops* was seen. When we approached the range we entered a belt of sugar gums (*Eucalyptus corynocalyx*), where we camped, this spot being well populated by bird-life.

Trichoglossus novæ-hollandiæ were nesting in the hollow gums. *Sittella pileata* were busy building a nest. *Pachycephala rufiventris* were pouring forth their glorious songs from the thick scrub on the edge of the timber. *Pomatorhinus superciliosus* were uttering their harsh cries as they hopped about amongst the timber. *Strepera fusca* was seen, also *Malurus cyaneus* and *Acanthiza pyrrhopygia*. Moving on to Lake Wangary we met with *Grallina picata*. The lake not having any bird-life upon it, we proceeded next morning to the coast, and visited some islands off shore, where *Neophema petrophila* had congregated to nest. *Lobivanellus lobatus* and *Ephthianura albifrons* were also nesting on these islands. From here we shaped our course past Mount Dutton, passing between the sea and the Marble Range. After some miles of low scrub we entered a fine tract of big swamp-gum country. In the heart of this we camped. On investigating the timber round the camp, *Trichoglossus novæ-hollandiæ* and *Glossopsittacus porphyriocephalus* were found nesting in great numbers.

Trichoglossus novæ-hollandiæ.—Seen in all stages, from young with grey down to fully-fledged birds ready to leave the nest; also fresh eggs.

Glossopsittacus porphyriocephalus.—Young, covered more or less in grey down, observed. Eggs varied from two to four; placed on the bare wood.

Corcorax melanorhamphus.—The large mud nests placed on horizontal limbs of red gums. Clutch, from four to seven, incubation in most cases well advanced.

Barnardius zonarius was also found here.

Having completed our observations we moved on, passing through a beautifully timbered country, where *Petrarca goodenovii* was very plentiful. Camping on the outer edge of this timber, we worked partly in it and partly in the surrounding pine and mallee country. The bird-life had changed but little; so we moved on to Lake Greenly, Mount Greenly rising on the far side. We worked about among the numerous salt swamps in the neighbourhood of Lake Greenly for some time. Many of the Waders were found. *Ptilotis sonora*, *Collyriocinclu rufiventris*, *Malurus*

cyaneus, *Acanthochaera carunculata*, and *Lobivanellus lobatus* were seen here. Entering rough and unproductive limestone country, we returned to the belt of big timber. None of this country, so far as I knew, had been worked by an ornithologist. Here in the big timber we saw a pair of *Dacelo gigas* for the first time on Eyre Peninsula. For the next few days the weather was rough—terrific winds swept the coast—and we did little work. We discovered *Porzana fluminea* in the high cutting-grass. On our return journey a halt was made at the belt of sugar gums, which proved so successful on our way out. We discovered a nest of *Strepera fusca* containing two eggs, incubation well advanced. The nest was a stick one, situated at the top of a sugar-gum, and very neatly lined with dry grass. We found a nest of *Uroaëtus audax* just lined with green gum-leaves, ready to receive the eggs. Working out on to a stony ridge, some distance from the timber, we came upon a small party of *Calamanthus*, which we at first took for *C. campestris*, but, on comparison, found that they resembled *C. albiloris* in colouration, although smaller. These birds have the habits of true *Calamanthus*. They perch upon the top of the bushes and pour forth a pleasing little song, with tail elevated. But directly they are alarmed they dart off and pass from bush to bush, like mice. On one or two occasions bushes in which these birds were concealed were trampled almost to pieces before they would come out, and then they darted along the ground with great rapidity to another bush. We found them always upon the rough, stony ridges covered with low bushes or heath-like plants. On the next stage we found a nest of *Strepera fusca*, placed in a smaller tree than usual. Not far from this we came upon another party of *Calamanthus* on a stony ridge covered with low bush. We observed another pair of adult birds and two young.

Arriving in our old camp at Warunda Creek just before heavy rain set in, we were glad to spend the next day—a very wild one—resting after a rough journey along the coast. We put in a few more days at Warunda, where we found another nest of *Strepera fusca*, built upon the topmost branches of a gum. The branch was long and tapering. After attempts to climb, two guys were put on to the limb, which was then cut off and lowered. The reward was a clutch of two eggs. Our attention had been drawn to this nest by the noise made by the female while she was being fed by the male. Not far from here we found a pair of *Uroaëtus audax* nesting. Nest contained two heavily-incubated eggs.

On the way back to camp we found a nest of *Burhinus grallarius* placed on bare ground among the big timber. A little further on, in a gum which had thrown out a number of young shoots, a nest of *Acanthochaera carunculata*, containing three young covered in grey down, was found. We worked the ranges for the next day or two, and observed two or three pairs of *Uroaëtus audax* nesting. Each nest was placed in a large gum-tree near a creek. One contained a single egg, well incubated, and of a very pale colour.

Another nest contained a clutch of two eggs, one egg being very strongly marked, the other pale. We found *Pardalotus ornatus* nesting in the hollow boles of the sugar gums. Some nests were partly constructed, while others were just finished. A nest of *Strepera fusca* was noticed at the top of a gum. We met with *Burhinus grallarius* and *Barnardius zonarius*. The latter birds were busy looking out their nests, chattering and wagging their tails in the fashion characteristic of all the "Broadtails."

Striking camp and conveying our luggage to the railway line took us the better part of half a day. The train pulled up and took us on board. Next day we left Port Lincoln for Arno Bay. Landing at midnight from the ship's boat on a primitive jetty, we hauled our luggage from the beach. Next morning we started out into the thick mallee scrub. Found a pair of *Hieracidea terigora* nesting in an old *Strepera*'s nest, and observed a pair of *Hylacola cauta*, which we felt sure were nesting. We spent much time in searching for the nest, but failed to locate it. We saw a male *Strepera* feeding the female on the nest, which was built near the ground, owing, no doubt, to the absence of a larger tree, there being nothing but mallee in the area. A pair of Black-eared Cuckoos (*Mesocallius palliolatus*) was observed, and in the next tree sat a *Podargus strigoides* of a very rufous colouration. *Pomatorhinus superciliosus* were very active in the scrub, and a pair of *Cracticus destructor* was seen nesting in a mallee. The nest was composed of sticks, and contained four dark olive-brown coloured eggs. *Cuculus inornatus* was plentiful on the edge of the scrub. We passed over a wide patch of samphire, and entered a scrub of weeping acacia (*Acacia*, sp.) which was in full blossom. Great numbers of *Ptilotis sonora* were present. Returning through the samphire, we saw *Egialitis ruficapilla*. They fluttered along in front of us, falling on their backs at times in their excited endeavour to draw us away from their nests. We came upon a small company of *Sericornis* in the samphire. When they became alarmed they darted into the samphire bushes like mice, and would allow us to tread the bush down where they were taking cover before they would leave. This was the same species as that met with lower down the Peninsula, we believed, but were not too sure of its being *S. maculata*.

Next day we went out along the coast, and by means of a pair of horses and a trap were able to cover a good stretch of country. The low scrub and heath proved very unproductive. *Collyriocincla rufiventris*, *Chalcococcyx basalus*, and *Acanthogenys ruficularis* were most abundant. Our next stage was more in the direction of the ranges. In a thick belt of mallee we met with *Ptilotis cratitia*, *P. leucotis*, *Pardalotus xanthopygius*, *Strepera fusca*, *Acanthochaera carunculata*, and *Collyriocincla rufiventris*.

Returning to Arno Bay for the last few miles, close to the sand-dunes we saw a very dark coloured Thrush in the mangroves, which were very thick along a salt creek. After a great deal of trouble we secured a specimen, which we believe to be *C. rufi-*

ventris. It resembles that bird, excepting that its entire plumage is very dark, due, no doubt, to its living among the mangroves. In the sand-dunes we found *Myzantha flavigula* and a *Sericornis* which seems similar to the one in the samphire country.

Leaving Arno Bay at midnight in a dinghy for the steamer, which lay some distance off the shore, we returned to Port Lincoln, where the boat stayed long enough for us to have a run through the scrub. We saw *Turnix varia* running over the stony ground in the thick scrub, and came upon another little party of *Sericornis*. Several specimens of *Eopsaltria gularis* were observed, and, for the first time during this trip, we heard the song of *Pachycephala meridionalis*. In the thick bush *Malurus cyaneus* were nesting. There were still great numbers of *Trichoglossus novæ-hollandiæ* about, in company with *Glossopsittacus porphyriocephalus*. They were feeding on the mallee-flowers, and guns were being discharged on every side. It being Saturday afternoon, numbers of lads were out from the town bent on bird slaughter. Leaving Port Lincoln that evening, we were home next day, and so ended a very successful trip.

Two families of birds were met with on this trip—namely, *Calamanthus* and *Sericornis*—which will take a good deal of looking into, and, from the material we have secured, some new divisions should be made. The distribution should prove very interesting. Expeditions of this character should bring to light, if not new species, at least many variations hitherto overlooked. The light brown variety of *Sericornis* which we found in many parts of Eyre Peninsula seems to be in two distinct forms. The one noted by the members of the R.A.O.U. at Warunda in 1909 still holds good, and is evidently *S. maculata*. Comparing specimens taken during the camp-out in 1909 with some taken near Adelaide and those from Western Australia, one cannot tell one from the other; yet, according to Mr. A. J. North's description, this is not *maculata*. What, then, is it?

Examination of Contents of Stomachs and Crops of Australian Birds.

By J. BURTON CLELAND, M.D., Ch.M., Principal Assistant Microbiologist, Bureau of Microbiology, Sydney, N.S.W.

IN two previous numbers of *The Emu* * the results have already been given of the examination of the stomachs and crops of 200 birds found in Australia. The present series is a continuation of this, and consists of the examination of the contents of a further number (105) of birds, making a total so far recorded of 305.

I am again indebted to the valuable information contributed by Mr. W. W. Froggatt, F.L.S., Government Entomologist, New South Wales, and to Mr. J. H. Maiden, F.L.S., Director of the

* Vol. ix., p. 219, and vol. xi., p. 79.

Botanic Gardens, Sydney, under whose direction Mr. E. MacKinnon, B.Sc., has identified seeds, &c., present. I have also to thank the authorities of the Australian Museum, Sydney, for helping on a number of occasions, especially Mr. C. Hedley, F.L.S., and Mr. A. MacCulloch. I am also very much indebted to Dr. T. L. Bancroft, of Eidsvold, Queensland, for kindly forwarding a large number of specimens, which are labelled as from Queensland. These were sent to Dr. Harvey Johnston and myself during our investigations for the presence of parasites. I am indebted to Mr. L. Harrison, R.A.O.U., for the identification of a number of these Queensland specimens of birds.

As in previous papers, Mathews' Hand-list has been followed, the letter M. standing for this list, while Hall's number is also given, and the vernacular name which he adopts.

Catheturus lathami (M. 7, H. 567). Brush-Turkey.

Queensland.

Full of seeds—round black ones, grass seeds, &c.

(E.M.) *Geijera*. These may be *Xanthoxylum* (sp., e.g., thorny yellow-wood), but the size and shape of the embryos seem to be *Geijera*. As these seeds appear in no less than 15 of the specimens from the Murray to Queensland, I think they are probably *Geijera* (sp.) Grass seed—only free internal grain, no glumes; cannot identify species or genus.

Geopelia placida (M. 34, H. 547). Peaceful Dove.

Eidsvold, Queensland.

Small, round, dark brown seeds.

(E.M.) *Cyperaceæ*.

Geophaps scripta (M. 42, H. 555). Partridge Bronze-wing Pigeon.

Queensland.

Oval blackish seeds.

(E.M.) *Geijera*. (See M. 7, H. 567.)

Ibis molucca (M. 194, H. 702).

Portions of crustaceans.

(A. MacCulloch.) *Grapsidæ*.

Herodias timoriensis (M. 203, H. 710). White Egret.

Remains of a shrimp; portions of grasshoppers (?).

(W.W.F.) Black cricket (*Gryllus servillei*); young shrimp.

Platycercus pallidiceps (M. 339, H. 503). Pale-headed Parrakeet.

Queensland.

Small whitish and brownish seeds.

(E.M.) Two pieces of quartz and many pieces of black mineral matter present. The rest of the specimen consists of the grain of some grass, but only an odd glume or two can be found, and the species cannot be identified. There are many of the free grains present.

Merops ornatus (M. 396, H. 442). Bee-eater.

(a) Queensland.

Portions of beetles (?) and Hymenoptera.

(W.W.F.) Native banded bee (*Podalerius*, sp.) (Hymenoptera); *Sphex*, sp. (Hymenoptera); red-bodied native bee (Hymenoptera); tabanid fly (*Tabanus*, sp.) (Diptera); remains of other flies, bees, and beetles.

(b) Queensland.

Portions of Hymenoptera and other insects.

(W.W.F.) Hymenoptera—*Thynnus*, sp.; several bees; several froghoppers (*Eurymela*, sp.); remains of beetles.

(c) Queensland.

Portions of Hymenoptera, &c.

(W.W.F.) Ant-lion (*Glenurus*, sp.); remains of cricket; forest fly (fam. *Dexiidae*); another fly; remains of flies and beetles.

Chalcococcyx plagosus (M. 412, H. 462). Bronze-Cuckoo.

Queensland.

Full, apparently, of remains of hairy caterpillars.

(W.W.F.) Lepidopterous larva (*Geometridæ*); brown looper caterpillar.

Microœa fascinans (M. 433, H. 86). Brown Flycatcher.

(a) Queensland.

Portions of beetles.

(W.W.F.) Beetle and ant remains, and remains of small Orthoptera.

(b) Queensland.

Portions of beetles.

(W.W.F.) Remains of ants and beetles.

(c) Queensland.

Portions of beetles.

(W.W.F.) Chiefly ants; a few remains of beetles.

(d) Queensland.

Portions of beetles.

(W.W.F.) Beetle and ant remains, small caterpillar, and remains of small Orthoptera.

(e) Queensland.

A ladybird, fragments of beetles, &c.

(W.W.F.) Wood ants (*Polyrhachis*, sp.); chrysomelid beetle (*Paropsis*, sp.); two small spiders.

Smicrornis brevirostris (M. 449, H. 100). Short-billed Tree-Tit.

(a) Eidsvold, Queensland.

Several oval, rough, dark brownish seeds.

(E.M.) *Geijera*. (See M. 7, H. 567.) The rough and brownish appearance is due to the testa being digested at numerous points, giving a pitted appearance.

(b) Murray Flats.

Fragments of insects.

(W.W.F.) No insect remains that can be determined.

(c) Eidsvold, Queensland.

Some minute fragments of insects and vegetable tissue.

Rhipidura albiscapa (M. 476, H. 133). White-shafted Fantail.

Queensland.

Portions of insects.

(W.W.F.) Small homopterous insect (*Cercopidæ*), ants, and several native bees.

Rhipidura tricolor (M. 487, H. 139). Black-and-White Fantail.

(a) Eidsvold, Queensland.

Fragments of insects.

(W.W.F.) Chiefly the remains of ants and small beetles.

(b) Queensland.

Portions of insects.

(W.W.F.) Robber flies (*Asilidæ*), (wings, legs, and head).

Coracina robusta (M. 504, H. 78). Black-faced Cuckoo-Shrike.

Coonalpyn, South Australia.

Portions of grasshoppers.

(W.W.F.) Remains of small green mantis and a few beetle-wings.

Edoliisoma tenuirostre (M. 509, H. 83). Caterpillar-eater.

Queensland.

Remains of grasshoppers (?); some large blackish seeds.

(W.W.F.) Orthoptera—long-horned grasshopper, probably a form of tree-cricket, but no thighs or head to identify.

(E.M.) *Geijera* seeds. (See M. 7, H. 567.)

Cinclosoma castanonotum (M. 516, H. 213). Ground-Bird.

South Australia.

Some oval black seeds, some longer yellow ones, and a grass seed.

(E.M.) *Geijera*. (See M. 7, H. 567.) Some whole, some broken and the cotyledons free, and so appear as yellow seeds. One grass seed (*Bromus*) appears to be *B. sterilis*, L.

Drymacædus brunneipygius (M. 521, H. 218). Scrub-Robin.

(a) Coonalpyn, South Australia.

Fragments of a beetle, &c.

(W.W.F.) Ants and heteromorous beetles.

(b) Coonalpyn, South Australia.

Fragments of insects, &c.

(W.W.F.) Remains of ants and small beetles.

(c) Murray Flats, South Australia.

Fragments of insects; about a dozen large, round seeds.

(W.W.F.) Hard black seeds and remains of ants.

(E.M.) Seeds of *Geijera*. (See M. 7, H. 567.)

Hylacola cauta (M. 525, H. 222). Red-rumped Ground-Wren.

Coonalpyn, South Australia.

Fragments of beetles, &c.

(W.W.F.) Remains of beetles, and small leaf-hopper (*Cercopidæ*).

Chthonicola sagittata (M. 558, H. 187). Little Field-Wren.

Queensland.

Seeds—(a) small triangular brown ones, (b) larger oval yellowish-brown ones; few minute fragments of insects.

(E.M.) Grass, *Setaria glauca*; small—8 seeds of *Cyperaceæ* with triangular cross-section.

Acanthiza pusilla (M. 561, H. 190). Brown Tit.

Middle Harbour, Sydney, 15th April, 1911.

Fragments of insects; small white eggs of insect.

(W.W.F.) Beetle remains and some bits of wings of lace-wings.

Acanthiza pyrrhopygia (M. 568, H. 193). Red-rumped Tit.

(a) Coonalpyn, South Australia.

Fragments of small beetles, &c.

(W.W.F.) Termites' (white ants') wings; remains of small beetles.

(b) Coonalpyn, South Australia.

Fragments of small beetles, &c.

(W.W.F.) Remains of small beetles, but nothing definite.

Acanthiza uropygialis (M. 573, H. 195). Chestnut-rumped Tit.

Murray Flats, South Australia.

Two small, brown, disc-shaped seeds.

(E.M.) Salt-bush, but species not identifiable—seed only present, without membranes, &c. (N.O. *Chenopodiaceæ*.)

Fragments of insects.

(W.W.F.) Chiefly dipterous remains.

Sericornis brunnea (M. 580, H. 199). Redthroat.

Queensland.

Portions of a large insect; several long, curved yellow "seeds."

(W.W.F.) Larvæ of moth; beetle remains.

(E.M.) Not seeds—insect eggs and embryos.

Stipiturus malachurus (M. 610, H. 174). Emu-Wren.

(a) Middle Harbour, Sydney, 15th April, 1911.

Fragments of insects.

(W.W.F.) Small Homoptera and a few beetle remains.

(b) Fragments of insects.

(W.W.F.) Insect remains too indefinite to determine, but probably beetles and some Homoptera.

Grallina picata (M. 646, H. 67). Magpie-Lark.

Queensland.

Three kinds of seeds—(1) narrow black, (2) rounded black, (3) oval yellow; portion of a grasshopper and other insects.

(E.M.) (1) Insect egg-cases, (2) a legume, (3) grass (*Setaria*—probably *S. glauca*), 3 mm. long.

(W.W.F.) Weevils and other beetles; a long-horned grasshopper.

Cracticus destructor (M. 658, H. 252). Butcher-Bird.

(a) Eidsvold, Queensland.

Remains of insects; several elongated kidney-shaped "seeds," yellowish-brown to black.

(W.W.F.) Beetle remains, earwig, and wings of Orthoptera.

(E.M.) Not seeds—eggs of insects.

(b) Queensland.

Portions of grasshoppers and beetles.

(W.W.F.) Large mantis; chrysomelid beetles (*Paropsis*, sp.); cockroach; heteromerous beetles; other beetle remains.

(c) Queensland.

Remains of grasshoppers; large brown seeds.

(W.W.F.) Brown moth (Noctuids).

(E.M.) *Geijera* seeds. (See M. 7, H. 567.) Black testa gone.

(d) Hawkesbury River, 29th June, 1911.

Smell of bugs. One large bug and many remains of insects.

(W.W.F.) Green plant bug (Hemiptera), *Cuspidonia*, sp.; wings of flies; beetle remains.

Oreoica cristata (M. 662, H. 258). Bell-Bird.

Coonalpyn, South Australia.

Fragments of insects; a grain of wheat.

(W.W.F.) Some grains of wheat; ants (*Camponotus*, sp.); remains of small beetles.

Pachycephala rufiventris (M. 674, H. 271). Rufous-breasted Thickhead.

(a) Queensland.

About eight rounded, mottled seeds; portions of a grasshopper (?), &c.

(E.M.) *Geijera*. (See M. 7, H. 567.) Mottled appearance due to unequal wearing of testa.

(W.W.F.) Remains of long-horned grasshopper; a few insect remains.

(b) Queensland.

Most of a large grasshopper, and other insect fragments; one brownish "seed."

(W.W.F.) Green grasshopper (*Cædicia valida*); other insect remains.

(E.M.) Not a seed, but an egg-case (chitinous).

Pachycephala gilberti (M. 676, H. 273). Gilbert Thickhead.

Murray Flats.

Some round black seeds and smaller yellow ones.

(E.M.) *Geijera*. (See M. 7, H. 567.) Smaller yellow ones are the cotyledons, &c., set free from the hard enclosing testas.

Eopsaltria australis (M. 683, H. 259). Yellow-breasted Shrike-Robin.

Hawkesbury River.

Beetles and other insects.

(W.W.F.) Yellow cicada (Homoptera); chrysomelid beetle (*Calomela*).

Eopsaltria chrysorrhoa (M. 684, H. 260). Yellow-rumped Shrike-Robin.

Queensland.

Fragments of beetles; one rounded, rough brown seed.

(W.W.F.) Chiefly spiders; a few beetle remains.

(E.M.) *Geijera* seeds. (See M. 7, H. 567.) Black testa gone.

Aphelocephala leucopsis (M. 689, H. 239). Whiteface.

(a) Murray Flats, South Australia.

Fragments of seeds, amongst them some elongated orange ones and some fragments like wheat.

(E.M.) All grains of wheat, in various stages of digestion and preservation.

(b) Murray Flats.

Fragments of seeds, amongst them one grain of wheat and about a dozen orange-coloured seeds.

(E.M.) All wheat grains.

Neositta pileata (M. 697, H. 289). Black-capped Tree-runner.

(a) Murray Flats, South Australia.

Small beetles, a grub, &c.

(W.W.F.) Small leaf-hoppers (*Cercopidæ*); Homoptera; a few beetle remains, among them one click beetle, mostly taken under bark.

(b) Murray Flats, South Australia.

Small beetles, grub, &c.

(W.W.F.) Click beetle, ants, froghopper (*Fulgoridæ*), small heteromorous beetle—all probably taken on tree-trunk.**Climacteris picumna** (M. 704, H. 281). White-throated Tree-creeper.

Murray Flats, South Australia.

Fragments of insects; some minute vegetable fragments.

(W.W.F.) Nearly all remains of ants; a few beetle remains.

Zosterops cœrulescens (M. 712, H. 301). White-eye.

(a) Queensland.

Fragments of beetles; a yellow "seed."

(W.W.F.) Remains of small beetles.

(E.M.) The "yellow seed" is an insect egg—a round, smooth case with a yellow mass of yolk.

(b) Middle Harbour, Sydney, 24th June, 1911.

Fragments of insects, amongst them a small beetle; some fragments of vegetable tissue, and two smallish, dull green oval seeds (? *Exocarpus*).

(W.W.F.) A small weevil; mainly remains of a very small brown weevil. Hardly anything else except this beetle.

(E.M.) Seeds of some legume.

(c) Middle Harbour, Sydney, 24th June, 1911.

Fragments of insects; skin of caterpillar.

(W.W.F.) Mites, hawk-moth larvæ, a number of small caterpillars, remains of aphids.

Pardalotus punctatus (M. 726, H. 379). Spotted Pardalote (Diamond-Bird).

Queensland.

Fragments of beetles; (?) lerp-scales.

(W.W.F.) Remains of small chrysomelid beetles (chiefly).

Pardalotus melanocephalus (M. 729, H. 382). Black-headed Pardalote.

(a) Eidsvold, Queensland.

Fragments of insects and spiders.

(W.W.F.) Remains of beetles, and a few larvæ, perhaps of Diptera.

(b) Eidsvold, Queensland.

Fragments of insects; some lerp-scales (?).

(W.W.F.) Beetle remains (*Chrysomelidæ*).

(c) Eidsvold, Queensland.

Fragments of insects; some white lerp-scales (?); several minute yellow seeds.

(W.W.F.) Indefinite remains of small beetles.

(E.M.) The "seeds" are eggs of insect—about 1 mm.

(d) Eidsvold, Queensland.

Part of a grub; fragments of beetles, &c.

(W.W.F.) Chrysomelid beetles (*Cadmus* and *Cryptocephalus*, fam. *Chrysomelidæ*); moth caterpillar.

(e) Eidsvold, Queensland.

Fragments of beetles, &c.

(W.W.F.) Small chrysomelid beetle; a Membracid and other Homoptera.

(f) Eidsvold, Queensland.

Fragments of beetles, &c.

(W.W.F.) Remains of beetle, but nothing definite.

(g) Eidsvold, Queensland.

Fragments of insects; (?) skins of grubs; one small yellow seed.

(W.W.F.) A looper caterpillar; beetle remains, very indefinite.

(E.M.) The "seed," egg of an insect, 1.5 mm. long. A white chitinous case, with a yellowish-green embryo visible through it.

(h) Eidsvold, Queensland.

Fragments of insects.

(W.W.F.) Insect remains—nothing definite; a few bits of beetles.

Melithreptus gularis (M. 737, H. 310). Black-chinned Honey-eater.

Queensland.

Fragments of insects; portion of a grub (?).

(W.W.F.) Beetle and dipterous remains.

Melithreptus brevirostris (M. 741, H. 313). Brown-headed Honey-eater.

Coonalpyn, South Australia.

Fragments of insects.

(W.W.F.) Remains of beetles and several small moth larvæ.

Plectorhamphus lanceolatus (M. 745, H. 316). Striped Honey-eater.

(a) Queensland.

A mass of vegetable hairs; some fragments of insects.

(W.W.F.) Remains of small caterpillar.

(b) Queensland.

Three round, black seeds.

(E.M.) *Grijera*. (See M. 7. H. 567.)

Ptilotis fusca (M. 769, H. 328). Fuscous Honey-eater.

(a) Murray Flats.

Fragments of insects.

(W.W.F.) Insect remains; wing of fly (Diptera).

(b) Queensland.

Fragments of beetles, &c.

(W.W.F.) Beetle and ant remains.

(c) Queensland.

Fragments of beetles, &c.

(W.W.F.) Remains of very small Coleoptera.

(d) Queensland.

Fragments of beetles, &c.

(W.W.F.) Remains of ants and few beetles.

(e) Queensland.

Fragments of beetles, &c.; a few lerp-scales (?).

(W.W.F.) Remains of ants and some wings of bees.

(f) Queensland.

Fragments of beetles, &c.; a few lerp-scales (?).

(W.W.F.) Beetle remains more plentiful, also ant remains

(g) Queensland.

Fragments of insects.

(h) Queensland.

Fragments of beetles, &c.

(W.W.F.) Small beetle and other ant remains; wings of Neuroptera.

(i) Queensland.

Fragments of beetles, &c.

(W.W.F.) Beetle and ant remains.

(j) Queensland.

Fragments of beetles, &c.

(W.W.F.) Chiefly remains of small beetles.

(k) Queensland.

Fragments of beetles.

(W.W.F.) Remains of beetles and flies.

Ptilotis sonora (M. 772, H. 334). Singing Honey-eater.

Purplish-coloured seeds.

(E.M.) *Enchylana tomentosa*, R. Br. (N.O. *Chenopodiaceæ*).

Small black seeds, and an oval yellow larger one.

(E.M.) All salt-bush, with membrane in various stages of preservation; large yellow one has most of membrane present.

Ptilotis cratitia (M. 783, H. 344). Wattle-cheeked Honey-eater.

Coonalpyn, South Australia.

Fragments of insects.

(W.W.F.) Nearly all ant remains, a number winged forms.

Ptilotis penicillata (M. 791, H. 346). White-plumed Honey-eater.
Murray Flats, South Australia.
Minute fragments of insects.

(W.W.F.) Very minute fragments of ants and Homoptera.

Meliornis pyrrhoptera (M. 797, H. 353). Crescent Honey-eater.
Adelaide, South Australia.
Fragments of insects.

(W.W.F.) Chiefly dipterous remains.

Meliornis novæ-hollandiæ (M. 799, H. 354). New Holland Honey-eater.

(a) Young bird, Coonalpyn, South Australia.

Minute fragments of insects.

(W.W.F.) Insect remains—nothing definite.

(b) Coonalpyn.

Portions of insects.

(W.W.F.) Nearly all remains of white ants (*Termetidæ*).

Entomyza cyanotis (M. 813, H. 368). Blue-faced Honey-eater.
Queensland.

Chiefly fragments of "fruit or seeds"; a few insect remains.

(E.M.) Pieces of shell—effervesce with acid; wax—soluble in ether. Nothing else distinguishable.

(W.W.F.) Lepidopterous larva; remains of Diptera, and beetle remains.

Philemon citreogularis (M. 819, H. 373). Yellow-throated Friar-Bird.

Eidsvold, Queensland.

Remains of insects; several rounded dark brown seeds.

(W.W.F.) Coleoptera remains, apparently ground beetles (lamellicorn).

(E.M.) *Geijera*. (See M. 7, H. 567.)

Oriolus sagittarius (M. 850, H. 62). Oriole.

(a) Queensland.

A number of dark brown seeds.

(E.M.) *Geijera*. (See M. 7, H. 567.)

(b) Queensland.

Several oval black seeds.

(E.M.) *Geijera*. (See M. 7, H. 567.)

Several white cedar fruits.

(E.M.) *Melia Azedarach*, Linn.

(c) Queensland.

Some purplish-tinted fruit with an elongated brown seed.

(E.M.) ?

(d) Queensland.

Many oval black seeds.

(E.M.) *Geijera*. (See M. 7, H. 567.)

Sphecotheres maxillaris (M. 852, H. 64). Fig-Bird.
Queensland.

About eight fruits of white cedar.

(E.M.) *Melia Azedarach*, Linn.

Chibia bracteata (M. 854, H. 66). Drongo.

Numerous large fragments of insects.

(W.W.F.) Wings of Orthoptera (grasshoppers); heads of longicorn beetles; other beetle remains.

Chlamydodera maculata (M. 861, H. 167). Spotted Bower-Bird.

(a) Queensland.

Many black seeds; some legs of insects.

(E.M.) *Geijera*. (See M. 7, H. 567.)

(b) Queensland.

Three white cedar berries.

(E.M.) *Melia Azedarach*, Linn.

Some fragments of insect wings.

(c) Queensland.

Four white cedar berries; one orange fruit.

(E.M.) White cedar (*Melia Azedarach*, Linn.)

(d) Queensland.

Two white cedar berries.

(E.M.) *Melia Azedarach*, Linn.

(e) Queensland.

Four white cedar berries.

(E.M.) *Melia Azedarach*, Linn.

Coreorax melanorhamphus (M. 883, H. 54). White-winged Cough.

(a) Queensland.

A large beetle; many other fragments of insects; seeds—(a) small yellowish, (b) large oval brown.

(E.M.) (a) Two *Setaria glauca*: the rest a mixture of grains free from the glumes, and some with glumes which appear to be a species of panicum; (b) ?

(W.W.F.) Locusts (grasshoppers); Heteromera (ground beetles); spiders.

(b) Portions of large insects (? cockroaches); a number of grass seeds.

(W.W.F.) Large quantity of seeds; remains of heteromorous beetles; two bits of skin-like material, not caterpillars.

(E.M.) Seeds, either *Gramineæ* or *Cyperaceæ*.

INTRODUCED BIRDS.

Passer domesticus. Sparrow.

Fragments of grain.

Emus Bugged.—Brewarrina (N.S.W.)—Neither feed nor water is to be had anywhere in the district. Emus make their way to the waterholes, most of which are almost dry, and the birds, in their quest after water, wade through mud and become bogged. They are mostly too weak to extricate themselves, and hundreds are meeting their death in this way. Half a dozen residents of the district are making a lucrative living by shooting Emus and skinning them, the skins bringing from 6s. to 8s. each in Sydney.—*Argus*, 1/5/12.

New Birds for Australia.

BY A. J. CAMPBELL, COL. MEM. B.O.U., MELBOURNE.

(Published in "Bulletin No. 3" of the R.A.O.U., 21/5/12.)

MR. H. L. White, of Belltrees, New South Wales, has been good enough to send for examination and exhibition a small parcel of northern skins, among which three may be separated as new, namely:—

(1) *Ptilonorhynchus minor* (Lesser Satin Bower-Bird).

The discovery of a second but smaller species of the familiar Satin Bower-Bird is of considerable interest to ornithologists.

The new bird is from that rich region the Herberton Range (the peculiar home of such novelties as *Scenopæctes* and *Prionodura*), and is about half the bulk of its more southern representative, *P. violaceus*. Two mature males secured possess the same lustrous, deep blue-black plumage as that of the larger Satin Bower-Bird.

The following are the comparative dimensions in inches of the two birds:—

P. violaceus—Length, 13; wing, 6.5; tail, 5; tarsus, 2; culmen, 0.9.

P. minor— „ 10.5; „ 5.75; „ 4; „ 1.75; „ 0.8.

Mr. White describes the eggs of *P. minor* in the pages of this *Bulletin*, while the description of the female and further information concerning this species will be awaited with interest.

(2) *Ptilotis carpentariensis* (Gulf Honey-eater).

Dr. E. P. Ramsay, in his "Tabular List of Australian Birds" (1888), indicates *P. cratitia* for Port Darwin and Gulf of Carpentaria districts. Mr. A. J. North, in a more recent work ("Special Catalogue No. 1" of the Australian Museum), does not mention either of those districts for *P. cratitia*.

However, in the collection above mentioned is a *Ptilotis* from Burketown resembling *cratitia*, but its general colouration is more yellow, especially the margins of the primaries and tail feathers, about the gape, &c., while the dark mark across the face is brownish instead of dull black.

There is no collector's note on the label of the specimen to indicate what was the colour of the naked flesh at the gape in the living bird, which in *P. cratitia* is lilac.

As the bird was collected near the shores of the Gulf of Carpentaria, the name *Ptilotis carpentariensis* is suggested for it.

(3) *Ptilotis sub-chrysops* (Lesser Yellow-faced Honey-eater).

Attention has been more than once drawn to the smaller variety of *P. chrysops* frequenting the coastal scrubs of Northern Queensland, notably the Cooktown district.

Although northern and southern birds are similar, except for size, it is feasible to suppose that *P. chrysops*, frequenting, say, the

rocky Grampian Range in Victoria, is not identical with the bird inhabiting the luxuriant scrubs of the Bellenden-Ker Range in tropical Queensland. No doubt ornithological students will agree to separate the northern bird under the suggestive name of *subchrysoptis*, with a wing-measurement of 2.9 inches, as against 3.2 inches for that of a typical *chrysoptis*.

Piezorhynchus alecto (Temminck).

Mr. White's enterprise has won yet another bird, which, although known, is new for the continent.

Although not altogether a surprise, it is interesting to discover the New Guinea Shining Flycatcher at Cape York, where Mr. White's specimens (♂ and ♀) were obtained.

As the late Dr. Bowdler Sharpe, in the "Catalogue of Birds," British Museum (vol. iv., p. 415), states:—"The Australian bird (*P. nitidus*) differs from *P. alecto* in possessing a much longer and thinner bill, while the females are thus contrasted—*alecto*, mantle light chestnut, like the back; *nitidus*, mantle dark ashy, shaded with the purple colour of the head, and separating the latter from the back, which is dark chestnut."

Mr. Gregory Mathews, in *Bulletin of the British Ornithologists' Club*, No. clxxi., described last year a Shining Flycatcher from the Cooktown district under the name *P. nitidus wardelli*, and remarks the adult male differs from the typical *P. nitidus* in "having a shorter and wider bill, the general colour deeper, and the measurements slightly larger."

While camped at Cardwell, August, 1885, I obtained a pair of Shining Flycatchers (now in the National Museum, Melbourne), which agrees with Mr. Mathews' Cooktown specimens so far as the description of bill is concerned.

Description of Eggs of Lesser Satin Bower-Bird (*Ptilonorhynchus minor*, Campbell).

BY H. L. WHITE, R.A.O.U., BELLTREES, N.S.W.

(Published in "Bulletin No. 3" of the R.A.O.U., 21/5/12.)

Types.—Eggs oval in shape; surface of shell slightly glossy, and under the lens minute pittings like pin-pricks appear all over the shell, thus rendering it slightly granular. Ground colour light cream, beautifully blotched and spotted all over, particularly at the larger ends, with reddish-brown, umber, purplish-grey and slaty markings; the last two colours appear as if beneath the surface of the shell, and predominate in both eggs. The pair measure in inches:—(a) 1.70 x 1.10, (b) 1.68 x 1.11.

Taken by Mr. Geo. Sharp, at Evelyn scrubs, Cairns district, North Queensland, 26th November, 1908.

Co-Types.—Eggs slightly more swollen than those of the type

set; surface of shell minutely pitted all over, and having but little gloss. In shape pointed ovals. Ground colour (a) light cream, (b) light yellowish-cream, sparingly spotted and blotched, chiefly at the larger ends, with amber and reddish-brown, also purplish-grey and slaty markings appearing as if beneath the surface of the shell. The pair measure in inches:—(a) 1.73 x 1.15, (b) 1.74 x 1.17.

Taken by Mr. Geo. Sharp, at Cedar Creek, near Evelyn, Cairns district, North Queensland, 3rd November, 1908.

In a series of seven sets of two eggs each, two pairs only have the ground colour of a darkish cream. This series when placed beside those of the southern bird (*P. violaceus*) are readily separated, the eggs of *P. minor* being smaller, not so swollen in shape, and of a much paler ground colour. Again, in the markings spots and blotches only occur, there being no lines, as is often the case with the eggs of the southern form.

Description of Eggs of *Ninox strenua* (Gould).

By H. L. WHITE, R.A.O.U., BELLTREES, N.S.W.

(Published in "Bulletin No. 3" of the R.A.O.U., 21/5/12.)

On page 48 of "Nests and Eggs of Australian Birds," Mr. A. J. Campbell describes an egg from the Adelaide Museum, supposed to be that of *Ninox strenua*, but he observes:—"However, we shall welcome any information giving a description of a complete set."

In view of the measurements of the eggs described below, I think the Adelaide Museum specimen is most probably that of *Ninox rufa*, Gould, as it corresponds in size with specimens of the eggs of that species in my collection. The eggs of *Ninox strenua* have up to the present time been on the *desiderata* list of every Australian oologist; for my own part I had almost given up hope of ever obtaining them. However, through the kindness of Mr. Rowland Archer, of Tooradin, Victoria, I have his permission to describe the eggs, besides becoming the proud possessor of a specimen of the type set, Mr. Archer retaining the others.

The eggs, three in number, were taken by James Franks, a collector for Mr. Archer, from the spout of a tree growing in dense scrub, near Kingaroy, north of Brisbane, Queensland, on the 23rd November, 1911, the parent bird being clearly identified. The eggs are of typical *Ninox* shape, being almost round: the shell is pure white, close grained and glossy, with a few limy excrescences scattered over the surface; one specimen has a number of shallow longitudinal grooves or creases running the whole length of the shell.

Measurements in inches:—(a) 2.29 x 1.94, (b) 2.23 x 1.9, (c) 2.15 x 1.91.

Note.—Specimen *a* is in H. L. White's collection, *b* and *c* in that of Rowland Archer.

Lilac Nape-band on Female Bower-Birds (*Chlamydodera*).

BY H. L. WHITE, R.A.O.U., BELLTREES, N.S.W.

WITH the single exception in Mr. F. L. Whitlock's notes upon *Chlamydodera guttata* (*Emu*, vol. ix., pp. 212-219), I have noticed no reference to the fact that the female Bower-Bird is sometimes found bearing the lilac neck-band. Gould ("Birds of Australia," vol. i., p. 452) appeared to be in doubt upon the subject, but was near the mark when he suggested that the band may possibly be acquired by old birds.

Hall, in his "Key to the Birds of Australia," states (page 22) that the female of *C. maculata* has no lilac band.

North ("Nests and Eggs of Birds Found Breeding in Australia and Tasmania") describes the females of *C. maculata* (vol. i., p. 41), *C. guttata* (p. 48), and *C. orientalis* (p. 55) as having no lilac bands.

From various parts of Eastern Australia I have lately received skins of *Chlamydodera maculata* on which the lilac band shows plainly on some adult females. One of my collectors took the trouble to preserve in spirits a female body showing the lilac band and take same to Sydney, where it was dissected in the presence of a well-known member of the R.A.O.U. The collector in question states that about 40 per cent. of the females he skinned carried the lilac band. Mr. H. G. Barnard recently forwarded three skins of this species from the Dawson River, Queensland, two of which (females) show the coloured band, one being indistinct, the other almost as brightly coloured as on a male. Mr. F. L. Whitlock, in his article referred to above, clearly proves that old females of *C. guttata* are to be found with a distinct band; I have one such skin in my collection.

Mr. H. G. Barnard, while collecting for me at Cape York, in 1910, forwarded a skin of a female *C. orientalis* which shows a single pink feather at the back of the neck. In view of the experiences of these collectors, and after examining the skins forwarded by them, all of which were secured during the breeding season, I am of opinion that females of *C. maculata*, *C. guttata*, and *C. orientalis*, when fully matured and breeding, sometimes assume the lilac neck-band.

Metallic Starlings (Calornis).

BY E. J. BANFIELD, R.A.O.U., DUNK ISLAND (N.Q.)

SINCE the Metallic Starlings "are making them ready to fly," it is meet that one to whom their presence during seven months has given pleasure and food for reflection should speed them on their equatorial journey, and assure them of cordial greetings when they return next August as heralds and emblems of the reinvigoration of the sun. These lively, cheerful, self-important, squealingly

industrious birds perform such essential functions in the scheme of nature that others need not scoff when a mere observer of their habits expresses the opinion that, lacking them, North Queensland would be distinctly the poorer. Apart from æsthetics—and the birds are exceedingly handsome—they are desirable, because they transport hither and thither the seeds of plants, securing the distribution of species which otherwise have no special means of finding untainted soil in which to germinate. To study the habits of the birds irrespective of the “season’s difference” would be unsatisfactory, for their migratory flights are regulated by the weather. It is not for one moment argued that the Metallic Starling is a weather oraclé or prophet. Rather the reverse, for it is obviously misled and rendered uncomfortable by changes upon which even dull-witted humans may reasonably rely. The soaking rains of the wet are to him a vexatious interference. The birds are averse to the inevitable soaking and disarray of their sheeny, black, close-fitting feathers, and exclaim against the saturation of their bulky nests. Come the rains early or late, one detects a variation in the tone of the Starling’s impatient exclamations. It is not quite so sharp as when the air is dry and the sun flashes on burnished plumage. The tone is somewhat subdued. There is a strain of remonstrance and melancholiness foreign to the birds in happy moments. Perhaps it is that the discipline of the rains is too rigid for them. They fly from the wet against inclination.

Whether they come early and depart late, whether the several colonies have hatched out three or only two broods, whether the sly, calculating Grey Falcon has systematically harried the colonies or left them joyously free, whensoever they make them ready for flight, the Starlings, true to one of the ruling passions of the genus, assemble in flocks for the performance of aerial manœuvres, in which they act as though the separate entities had but a single brain. They cleave through the air with sword-like rigidity and cleanness, shrieking in unison. It may be fanciful to compare the evolutions to forked lightning, but certainly similar acute angles and startling tangents are manifested. Just now the black lightning is often in the air. There is reason to believe that these martial exercises are designed to perfect the ranks—the youngsters of the season—in the art of evading the death-dealing swoop of the Falcon and other predatory birds. Indeed, I have watched the evolution, not merely in times of peace and security, but as an actual and effective movement for the defeat of an easily baffled and exasperated enemy.

Judging from the alacrity with which the birds begin building on their advent in August, and the earnestness with which family duties are maintained during seven months, it is conceivable that but for the positive check of the rains they might maintain the vigorous fulfilment of the law for the propagation of the species all the year round. Though governed by its incidence, they appear to detest the wet. An early wet season sends them off, though with apparent reluctance. When a preliminary downpour

has rendered nests uninhabitable, a fine interval has so far deluded them that they have started to demolish and rebuild, only to be finally driven away by the despitful recurrence of the rain. Seldom do Metallic Starlings shriek and glitter in North Queensland jungles as late as the end of March. Here their departure has been noted as early as 20th February. They come to this spot during the first week of August. Last year they were first heard and seen on the 5th of that month, while at a spot only 7 miles away, on the mainland, they had made themselves apparent a fortnight earlier.

A colony which has re-established itself in a tall, slim Moreton Bay ash (eucalypt) in the heart of the forest, hatched out three, if not four, distinct broods during the season. At first the colony was 60 nests strong. In six weeks the number had increased by 30. The second hatching took place early in December, the third about the middle of January, and there is some evidence in favour of a fourth hatching late in February. Rain during January and February was not sufficient to seriously annoy the colony, which on 4th February included 125 nests. On that date two over-weighted branches broke down. In several of the nests were fledglings, but all save two had been killed by the shock, or had been slowly done to death by green ants. One of the survivors died shortly after discovery of its forlorn plight. The other lived as a pet for a couple of months. The adult Metallic Starling is remarkable for the colour and lustre of the eyes. They are flame-tinted, and glitter with gem-like brilliancy. During infancy the eyes of the castaway were deep brown, much the shade of its back. Not until a month after it had become one of the household did they begin to change. And the heightened pigment was not permanent. It became intensified or paled with the changeful moods. In quiet moments the eyes were thin, watery red. Excitement or anger deeply tinged them. One could see the tints of the iris vary with almost every pulsation. The emotions of the little bird—its familiarity and bold assurance gave unique opportunity for critical inspection—were expressed in terms of more or less vivid colour.

On 3rd December three or more nests were discovered under the tree. In each there were three eggs, all slightly incubated. Each nest was carpeted with fragments of fresh green Moreton Bay ash leaves, which had been torn and nibbled at the edges. What office do the green leaves perform? Possibly the pungency so agreeable to the human sense of smell may be obnoxious to the insects which fidget the adults, who, by the use of the frayed leaves, contrive peace for their sensitive offspring.

To return to the castaway: It was estimated that when about six weeks old it daily consumed food sufficient for an infant eight times its age. Its *menu* included oatmeal porridge and milk, rice, mango, papaw, bread, cake, large white grubs, grasshoppers, caterpillars, mosquitoes bloated with human blood, March and lesser flies, and samples of every edible unprotected from its

raids. It would feast on the scrag end of the neck of a recently decapitated fowl with as much apparent relish as on a mango. Having acquired a taste for milk, it refused to spoil its thirst with water, and since it was never a captive, and always alert, quick and questioning, it generally made itself understood, and got that which it wanted, if not with good grace then by persistence, or wile, or fraud. In its eagerness for its morning's porridge, it alighted in a plateful all steaming from the pot, and was so sadly scalded that feathers from the thighs indecently disappeared. It even ventured to dance upon the hot stove so that it might inspect the cooking of the porridge, all too slow for its precipitate appetite, but the feat was never indulged in a second time. Baths were taken regularly, for the bird was fond of water for the purpose of cleanliness, though despising it as a drink. It was fond of perching on the edge of the "blue tub," and ducking and sprawling therein, and would also submit to be well soused from the watering-pot. Birds from the same colony were wont to visit a chilli-bush growing within a few feet of the verandah, but the castaway never made friends, though it soon learnt to take chillies. Its first knowledge of that diverting fruit was, however, disastrous, for, instead of being swallowed whole, it was broken and tasted with deliberation. With a shriek of dismay and flooded eyes and gaping mouth, it flew to the kitchen, eloquently imploring the solace of milk. Ever after chillies were bolted. Occasionally the castaway would camp out on a mango tree, and its failure to appear one morning at its accustomed time for porridge and milk was not astonishing, although grievous, for the bush has many arboreal snakes. The life-history of the little bird was entertaining, because it afforded information as to the variety and quantity of food consumed, and, as the digestion was grossly imperfect, one was able to realize more completely the services of such an agent in the distribution of seeds. Millions of seeds must be transported by the several colonies every year, and thus is the vegetable kingdom helped to preserve its types. Moreover, excellent work is done by the species towards the checking of insect pests—grubs, caterpillars, flies, and the larvæ of beetles. They search the glistening fronds of cocoanut palms with ordered haste, and examine the spathes so shrewdly that one is inclined to marvel that any insect should survive to the injury of the palm. Where the soft green caterpillars gather together, there will the Metallic Starlings be joyfully busy.

In times past Metallic Starlings, in innocent youth, were eaten greedily by the aborigines, the associated nests being easily raided two or three times during the season. Nowadays, locally, the entertaining birds are petted in a certain sense and called by the aboriginal name. We do not refer to them as the Metallic Starling, or the Shining Calornis, or *Calornis metallica*, but as "Tealgon," the accent on the first syllable. Across the water, only $2\frac{1}{2}$ miles away, the bird is known as "Dill," a sound which imitates a frequent note. Many of the blacks' names are onomatopoeic.

A recent contributor to an English review, in an article on the Starling, was inclined to wonder "whether they do not possess some strange occult sense of organization which in the long process of evolution may carry them higher and higher in the scale of creation." That Metallic Starlings do benefit by the laws of community there can be no doubt; but their socialistic habits, on the other hand, appear to invite the raids of snakes and Hawks. It has not been uncommon this season to find a Grey Falcon in possession of the nestful tree, while all the adult birds have crowded into one close by, whence, with whimpering remonstrances, they have watched the enemy of their race, who does not appear to have wit enough to raid such shrewdly-domed nests. The Falcon generally seizes its prey on the wing, though I have heard of one accomplished grey burglar which was wont to tear open nests with its talons.

In addition to being transport agents, these Starlings are among the living jewels of the bush. To watch a dozen simultaneously swoop into a native cabbage (*Scævola koenigii*) and dart out again in a few seconds, each with a fruit in its beak, and slip arrow-like through the forest, is a pretty experience. The slim, jet-black, iridescent bodies, the red and gleaming eyes, the milk-white fruit, and impetuous, level flight, fulfil a scheme of colour and exhibition of speed which are not the least among the wonders of the tropical bush.

Breeding Habits of White Tern (*Gygis alba*) on Kermadec Group.

BY R. S. BELL.

(Communicated by W. R. Oliver, R.A.O.U., Auckland, N.Z.)

WHITE Terns begin to arrive at Sunday Island usually about the first week in September, but they are most irregular in their time of arrival and date of laying. For instance, I may mention that a half-fledged young one was found on 29th November, 1908, while, during the same season, the last new-laid egg found was on 10th January, 1909. The Terns are found in small colonies or in single pairs here and there along the east, south, and south-west coasts of the island. They are not found on any of the outlying rocks, nor, I believe, on any other island of the Kermadec Group.

The birds arrive, generally, in very small numbers at a time, though large flocks, apparently just arrived, have sometimes been seen. They settle almost at once on the trees in which they eventually breed. These trees they apparently occupy during the period of their stay, whether they breed or not. They always perch in them during the heat of the day and camp in them by night. Many fall victims to cats, for it is quite common to find three or four pairs (on one occasion as many as eight) mangled at the roots of a tree. These birds are very active morning and evening, when they may be seen gliding among the



White Tern nesting in pohutukawa tree.



White Tern's Egg (*in situ*) on branch of pohutukawa tree.

branches, and remind one very much of large white butterflies. They commence to lay about the 10th November, from which date until the end of the month most of the females lay. Some seasons no eggs are found before the end of November, in which case the majority lay from between that date and the 25th December. However, it is not uncommon to find eggs much earlier or later than the above-mentioned dates.

White Terns lay one egg only, always on a pohutukawa tree (*Metrosideros villosa*), and as far from the ground as possible. Sometimes they lay on the high lateral branches of a large upright tree, when two or three birds with eggs may be seen close together, but on different branches, for they are not very sociable birds; but more generally they are found singly, near the tops of long, thin, leaning trees, especially those leaning over a steep hillside or deep gully fully exposed to the wind. It is, in fact, on such trees that about three-fourths of the birds lay. They make no nest of any kind, but lay their egg on the bare stem or branch, wherever there is a little flat place or any inequality that will keep the egg from rolling off. They almost always lay on the main stem of the leaning trees, and rarely where it is less than 4 or 5 inches in diameter, though I have on three or four occasions seen an egg on a stem which was not more than about 3 inches thick. One egg was about 50 feet from the base of the tree, which was not more than 18 inches in diameter. I have in my possession a branch, $2\frac{1}{4}$ inches only in diameter, on which I found an egg. This is by far the smallest branch I have seen an egg on. These birds do not seem to mind whether the branch or stem on which they lay is level or not. Usually it is fairly horizontal, but sometimes it is very steep, occasionally, I should say, at an angle of 30° or 40° . In short, almost any place seems suitable, provided there is some inequality that will prevent the egg from rolling off while the tree is fairly still. Should the bird leave the egg, however, when there is only a light wind blowing, the egg is likely to fall. I have seen it do so sometimes. A suitable place for the egg may be formed by two slight ridges running somewhat spirally round the branch, in which case the egg is placed between them; or a little flat place where a branch forks laterally is sometimes used; or the egg may be laid on the side of a stem or branch, and merely supported by a bit of stout bark. Once I noticed an egg placed between a strip of bark and the side of a thin stem. The strip of bark was about 18 inches long and $1\frac{1}{2}$ inches wide. It was attached to the stem at one end only, the other being about 3 inches clear. The egg was placed about 6 inches from the secured end, where there was a gap between the bark and the stem of fully half an inch. I could give many other cases of finding eggs in most precarious positions.

The usual place for the birds to lay is on a damaged place on the stem of a tree. These damaged places have the appearance of being caused by stones falling from the cliffs above. In time these stricken places become surrounded by a slightly raised ring

of young wood or bark, so that the whole looks not unlike a miniature volcanic crater or a small, funnel-shaped pit, with usually, though not always, a slightly raised rim. Somewhat similar places may be formed by dead branches dropping off, leaving a sort of socket. Such places are very common on pohutukawa trees, are no doubt formed in various ways, and are the chosen laying-places of about four-fifths of the White Terns. I have sometimes watched the birds at work on these places. They stand on the edge of the selected place (or pit, as I shall call it) and work round sideways, advancing the right foot first and scratching at the edge of the pit with the left. When they have worked round five or six times they stop, take a step or two backwards, and carefully examine what they have done, picking up with their bills any bits of loose bark they may have scratched off and casting them away. This operation is repeated until all the loose bark is cleared from the proposed laying-place. Occasionally both birds work at the pit together, each with its head over the other's left shoulder; but this is rarely done, as the pit is usually too small for two birds to work at together. It was noticed that whenever an egg was found the bark or wood about it was always most carefully cleaned.

Whenever the White Terns lay on a pit it is either a very large or a very small one. This is a rule to which there is practically no exception. The larger pits are never less than 8 or 10 inches in length (often they are much more), and any width from 1 to 6 or 8 inches. They generally have very little rim. They are usually sloping, and sometimes very steep. A fair number of birds lay in such places, but whenever they do the egg is always placed at some point where no rain water can collect about it. The small hollows are, however, much the more favoured laying-places, perhaps because they are more numerous; but, in any case, two-thirds of the birds use them. These pits are from about half to one inch across, and usually circular, so that when the egg is in position it is usually supported all round, and stands well above the surrounding wood or bark. I do not remember having seen an egg with more than about a third of its bulk below the level of the ring of bark, and generally it is placed much higher. In some cases the pit on which the egg is laid is so small that I have actually seen the egg totter when the bird retired at my approach. The only reasons for the egg being placed so high that I can at all understand is, firstly, to prevent any rain water which may collect in the pit in heavy weather from coming in contact with the egg; and, secondly, to allow the parent bird while incubating to almost—or, I believe, in most cases entirely—envelop the egg with its very long breast-feathers. I believe that the eggs are, in most cases, completely enveloped by the feathers of the birds while incubating, for, when sitting birds are approached very closely—and sometimes one can get within arm's length—they always leave their eggs. Their mode of doing so is suggestive, for they first begin to rise on their



White Tern on young one.



Young White Tern.

feet very slowly and gently, rocking their bodies slightly from side to side as though to work the tips of their feathers from under their eggs. Their actions on returning are somewhat different. They advance very close to the eggs (almost touching them), then fluff out all their feathers to their utmost, cover the eggs, and settle down upon them, returning their feathers to their normal position and rocking themselves from side to side as though to work the tips of their breast feathers well under the eggs.

As far as I am aware, the male bird sits throughout the whole period of incubation. I have at various times captured these birds, and without exception every one taken while on the egg was a male bird. Exactly how long the egg takes to incubate is not known for certain, but apparently it is not very long—probably not exceeding a month. When the egg is hatched one of the parent birds (probably the male) stays by the young for a week or ten days, apparently never leaving it for a moment, while the other brings minute fish and feeds the young one. The little fish are held crosswise, placed head to tail, in the bird's bill. Rarely fewer than two fish are brought at once, but sometimes as many as four. The bird must, therefore, hold one fish in its bill while catching another. It is a very common sight to see the White Terns fishing. They simply flutter over the water and catch the fish as they (the fish) jump out of the water.

It was noticeable that both the eggs and young of the White Tern, in general colour and markings, closely resembled the branches on which they are laid or hatched. For instance, a light-coloured egg is almost always found on a light-coloured branch, and a dark-coloured egg is, without exception, always found on a dark-coloured branch, and generally in a very shady place. The same is true of the young birds even to a greater extent. Their colour varies, when just hatched, from dark brownish-grey to very light grey, or almost white. They all gradually become lighter as they grow older, but they are still far from uniform, even when full feathered.

When approached the young birds lie down on the branch with their necks stretched out, in which position they may easily be mistaken for a little knob of grey lichen. They are very active, and run up and down the branch on which they live and squeal whenever a bird flies close to them. They seem to have a great dislike for Tuis (*Prosthemadera novæ-zealandiæ*), for these birds never miss an opportunity of attacking the Terns. The young cling to the bark of their home-branch most tenaciously if any attempt is made to handle them; indeed, if they get a good grip with both feet I believe it would be well nigh impossible to pull them away without dislocating their legs, for their feet are armed each with three large hooked claws. These grip the wood at the three points of a triangle, so that the more they are pulled the tighter they hold.

The young bird grows very quickly, and soon becomes feathered; but a remarkable point about them is that they can fly while they

are largely covered with down, and long before the pinion feathers are full grown. As soon as they are full feathered they go out fishing with their parents during the daytime, but always return to their birthplace to camp at night. It may be worth noting that the young birds are very dexterous at catching flies. They do not eat them, but just crush and drop them. This same practice is also indulged in by the young Masked Gannets (*Sula cyanops*), but I have not noticed it in any other young sea-bird.

The young White Terns leave Sunday Island during March and April.

Oologists in the Mallee.

BY F. ERASMUS WILSON, R.A.O.U., MELBOURNE.

(Read before the Bird Observers' Club, 20th December, 1911.)

THE following notes were collected during an oological excursion made by Mr. F. E. Howe, F.Z.S., and myself to the Mallee country, in the north-west of Victoria. Leaving Melbourne on the 26th of August, we journeyed to Ouyen, a new township lying 60 miles south of Mildura. We stayed there a day or two, and then pushed 56 miles further west to Kow Plains, a district lying about 30 miles from the South Australian border. We spent some days collecting in this neighbourhood, and then moved about 20 miles due north to a Government boring camp near the little-known Sunset country. Here we were comfortably put up by Mr. J. A. Scarce, and I here take the opportunity of thanking both him and his brother, Mr. H. Scarce, for their kindness to us during our stay.

The country in the immediate neighbourhood of Kow Plains consists of limestone flats, lightly timbered with Murray pine and mallee (eucalypt scrub), while further north and south extends an unbroken line of sand-ridges alternated with small flats, the sand-ridges running almost due east and west. There are a few old, dried-up salt-pans near Kow Plains, and a feature of them is the pure white hillocks devoid of vegetation. These are known by their old native name "copai," and consist of almost pure gypsum. Still further north are the dry salt lakes, which are covered with a saline living plant known as blue-bush (*Salicornia arbuscula*). From a spectacular point of view it would be hard to find country of more dreary appearance; but for the ornithologist it is full of interest, containing as it does so many of the rarest forms of bird-life. Ornithologically speaking this country is closely allied to the drier tracts of Western Australia, as on comparing the birds found here with those of the west you find many affinities. The discovery of the new Miner, *Myzantha melanotis*, so closely allied to the western form, *M. obscura*, and the finding of a bird agreeing with *Ptilotis nova-norciæ*, the western form of *P. leucotis*, go far to strengthen the ornithological bond between the two localities.

We identified 79 species of birds on the trip, but spent most of our time in the porcupine-grass tracts, as the avifauna met with there has a particular charm of its own. The scientific names are according to Mathews' "Hand-list" (*Emu*, vol. vii.)

Lipoa ocellata. Mallee-Fowl.—Judging by the number of old nest-mounds observed of this species, they must have been very numerous at one time in the Kow Plains district. Now, however, sad to relate, they are getting very scarce, and only one new nest was found during the trip. This nest was being prepared for the reception of the eggs, and was situated in a dense brake of bottle-bush (*Callistemon*) growing on the top of a sand-ridge. An immense hole had been scooped out of the earth, and the sand piled up around the edges. In the centre of this depression was a conical heap of vegetable *debris*, consisting principally of mallee gum leaves, twigs, and seed-pods. The ground had been scratched perfectly clean for many yards around, and in fact had the appearance of having been swept. This nest was situated within about 50 yards of a large dingo burrow, so that it is highly probable that, even if the young were reared out, they would fall an easy victim to these unscrupulous vermin. We obtained an immature female bird, which was singularly tame, allowing us to approach within about 20 yards of her.

Geopelia cuneata. Diamond (Little) Dove.—A few pairs of these birds were observed both at Ouyen and at Kow Plains, but at the time of our visit they seemed rather rare.

Phaps chalcoptera. Bronze-winged Pigeon.—We frequently flushed these fine birds in the tea-tree flats and amongst the porcupine grass at Ouyen and Kow Plains. Just at dusk they would come whirring down to the soak near our camp for their evening drink. This habit of going to water at night is frequently taken advantage of by Mallee settlers, who shoot numbers of them.

Zonifer tricolor. Black-breasted Plover.—These familiar birds were often seen in the open patches of country near Kow Plains, and a nest containing four incubated eggs was taken for us just prior to our visit.

Astur cruentus. Lesser Goshawk.—On three occasions we saw these birds at Kow Plains.

Uroaetus audax. Wedge-tailed Eagle. — These noble birds were frequently seen during the trip, and several nests observed, two of which were occupied. One was placed about 25 feet up in a leaning mallee-tree, and contained one egg, but on revisiting it a week later the egg had disappeared. The vast quantity of rabbit remains strewn about the nests testified to the immense amount of good these birds undoubtedly do, and which I think nullifies the harm they are accused of doing in taking a stray lamb occasionally. Another nest was located on the top of a Murray pine that had been broken off near the summit, and contained two chipping eggs. The female, on being flushed from the nest, immediately flew out of sight, and did not return while we were in the neighbourhood.

Hieracidea berigora. Striped Brown Hawk.—This species is common through the Mallee, but only three nests were discovered. One found by Mr. Howe near North Dam was placed in a small mallee-tree, and contained a fresh clutch of brilliantly-blotched eggs.

Ninox boobook. Boobook Owl.—A solitary bird was seen when we were staying at Kow Plains homestead.

Glossopsittacus porphyrocephalus. Purple-crowned Lorikeet.—Wherever there was a patch of big mallee eucalyptus, there these birds were nesting in flocks, every available hole being utilized as a nesting site. Nests containing every stage from the first egg to the chick ready to leave the

hollow were found. The nestlings when newly hatched are covered with a whitish down, and the nesting hollow containing them on being opened smells very strongly of honey. Sometimes the egg cavity would be close to the entrance, while at other times it would be at the bottom of the tree, 15 or 20 feet below. Around these nesting areas was a scene of constant activity, the parent birds continually setting out for and returning from the feeding grounds.

Cacatua leadbeateri. Pink Cockatoo.—These handsome birds were often seen in the Kow Plains district, where they frequently nest.

Cacatua roseicapilla. Rose-breasted Cockatoo.—This Cockatoo seemed to be a rare one in the districts visited, as only two pairs were noted during the trip.

Barnardius barnardi. Mallee-Parrakeet.—This is a very common bird in the Mallee country, and its handsome plumage never fails to attract the eye. We were somewhat early for eggs, as all the nesting hollows we examined were only being cleared out.

Psephotus haematonotus. Red-backed Parrakeet.—A few pairs were observed close to Ouyen, and a nesting hollow which the birds were clearing out noticed.

Psephotus multicolor. Many-coloured Parrakeet.—One specimen only of this delicately-plumaged bird was seen. It was flushed from some long grass, close to Ouyen station.

Podargus rossi. (Mathews).—This bird, which Mr. Mathews has, I think, rightly described as a new species, was met with both at Ouyen and Kow Plains. At both these places a nest was found containing two fresh eggs. The eggs, as has been pointed out by Mr. F. E. Howe, are considerably smaller than those of *Podargus strigoides*. In both the nests I examined green twigs of the turpentine shrub had been incorporated in the structure, which was otherwise made of dry twigs of the mallee eucalypt. The nest is the same shape and about the same size as that of *Podargus strigoides*, and is placed on a horizontal fork.

Egotheles novæ-hollandiæ. Owlet-Nightjar.—When tapping the larger mallee gums in search of hollow-loving species, we frequently disturbed these birds, some of which had already commenced nesting operations, as two or three incomplete sets of eggs were noticed.

Eurostopus albigularis. White-throated Nightjar.—Although we did not actually see these birds, we often heard their curious call near our camp on moonlight nights. Mr. J. Scarce also had the remnants of an undoubted egg of this species which he had found in the locality.

Cuculus pallidus. Pallid Cuckoo.—Cuckoos were all very plentiful, and the Pallid species was met with on all sides. They did not appear to have started laying, as, although we examined numerous suitable nests, no eggs were seen.

Cacomantis rufulus. Fan-tailed Cuckoo.—We were fortunate in finding a nest of *Hylacola cauta* containing two eggs and an egg of this species, the only Cuckoo's egg taken during the trip.

Mesocallius palliolatus. Black-eared Cuckoo.—The Mallee seems to be the home of this fine Cuckoo. They were very plentiful around our camp at Kow Plains North.

Chalcococcyx basalis. Narrow-billed Bronze-Cuckoo.—Common everywhere.

Chalcococcyx plagiator. Bronze-Cuckoo.—Fairly common, but not half as numerous as the preceding species.

Hirundo neoxena. Swallow.—These Swallows had a nest at the Kow

PLATE III.



Chestnut-backed Ground-Bird (*Cinclosoma castanonotum*).

FROM A PHOTO, BY A. H. E. MATTINGLEY.

Plains homestead, containing the unusually small clutch of two eggs, both of which were hatched before we started for home.

Petrochelidon nigriceps. Tree-Martin.—Wherever the large mallee gums grew, there these birds were numerous. Many nesting-hollows were examined, but in all cases we were too early for eggs. In one instance, the entrance to the nesting-hollow, proving too large and draughty, had been plastered up to respectable dimensions with mud.

Microeca assimilis.* Lesser Brown Flycatcher.—This species was common in all parts that we visited, and a few specimens were obtained for identification. In habits they are similar to the common *M. fascians*, and we were unable to distinguish between the notes of these two species. A diligent but unsuccessful search was made for their nests. They did not appear to have started building.

Petroeca goodenovii. Red-capped Robin.—This little gem was often met with in the black wattle country between Kow Plains homestead and the boring camp.

Petroeca bicolor. Hooded Robin.—In the more open country these Robins were always noticed, and seemed to be tamer than those usually met with in more southern districts. One nest placed in a myall tree contained a beautiful clutch of fresh eggs, one egg being blue and the other dark green.

Smicronis brevirostris. Short-billed Tree-Tit.—Was one of the commonest species met with, but, although so common, we rarely found their nests.

Rhipidura albiscapa. White-shafted Fantail.—Was found to be a very rare bird in this country, and only a few pairs of them were seen, none of which had started nesting.

Rhipidura tricolor. Black-and-white Fantail.—This common Fantail was particularly abundant around the Kow Plains homestead, and was seen in most places visited.

Sisura inquieta. Restless Flycatcher.—Several of these birds were seen near Ouyen, and a clutch of three eggs was taken. They were also numerous near the Kow Plains homestead.

Coracina robusta. Black-faced Cuckoo-Shrike.—Occasionally seen at Kow Plains and at Ouyen.

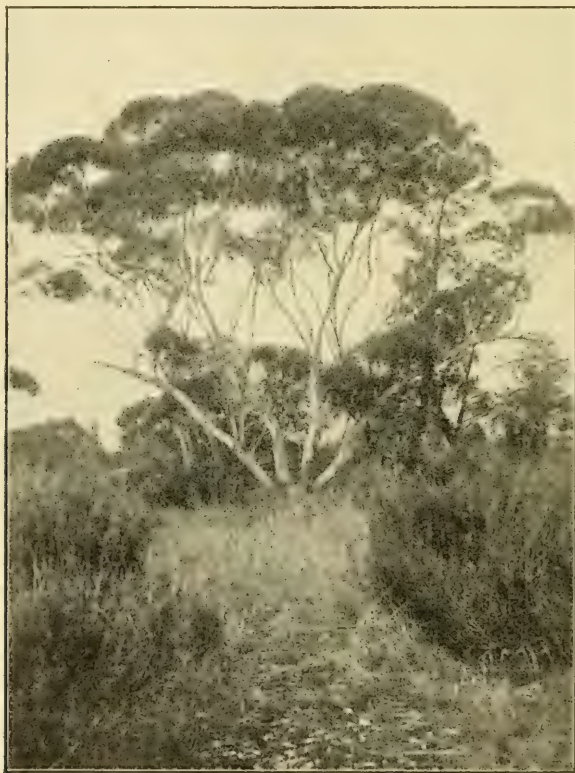
Cinclosoma castanonotum. Chestnut-backed Ground-Bird.—This species was met with in all parts of the Mallee, but we found it very hard to locate their nests.

Drymaedus brunneipygius. Scrub-Robin.—One of the objects of our trip was to obtain eggs of this scarce species, and we were fortunate in taking two clutches. Sometimes we found these birds in the open mallee timber, and at other times in dense thickets of acacia and turpentine-bush. We usually found that each pair was isolated from its nearest neighbours, and always had to approach with great caution to observe them. When, however, the nest was approached they would run all around us, but always took good care to keep away from their nests. They were very local, and sometimes we found three or four of the previous season's nests within short range of the new one. The nest was usually placed upon the ground at the base of a tree, or near a fallen log, but occasionally it was found built several inches off the ground on a heap of *débris*. One old nest seen was built on the top of the trunk of a fallen Murray pine. The nest is easily distinguished from that of other ground birds by the thick twigs arranged around the outside. The interiors of the nests examined were lined with fine twigs and rootlets, upon which the single egg was laid. The principal note

* This is a new record for Victoria. Has the bird been critically compared with the Western form?—EDS.

used, which is generally uttered when the bird is perched on some dead twig close to the ground, may be represented as "Chū chuŭ" the second syllable being the louder. They feed mostly on the ground, and are able to run very swiftly when disturbed. We took one nest, containing a fresh egg, within 150 yards of our tent at the boring camp.

Hylacola cauta. Red-rumped Ground-Wren.—These shy little aviformes are very common right through the Mallee, and we spent a considerable amount of time searching for their nests, which are sometimes beautifully hidden. In places where surveying operations had been carried on, straight lines cut through the scrub were often met with, and it was amongst the *débris* on these lines that the Hylacola loved to build. More often, however, the nest was placed in the fallen bark at the foot of the mallee saplings, and in these cases it harmonized with its surroundings so well as to make it



Turpentine-bush and big mallee.

FROM A PHOTO. BY A. H. E. MATTINGLEY.

an object extremely difficult to detect. They leave the nest at the slightest sign of danger, and run off quietly to a distance, when they usually utter two or three low notes. Nearly every patch of turpentine scrub had a few families of Hylacolas amongst it.

Pomatostomus superciliosus. White-browed Babbler.—These well-known birds are very plentiful throughout the Mallee, particularly on the Murray pine ridges, where scores of their nests were observed.

Calamanthus howei. Howe Field-Wren.—These timid little creatures we found to inhabit the dry salt-bush plains around Kow Plains and North Dam, and had great difficulty in obtaining specimens. We obtained four birds in all, and on dissection we found that if not already breeding they were very close upon it. The birds we obtained were all secured at the foot of a copai hillock, where two species of salt-loving plants grew. When flushed they sought refuge in the prickly salt-bush, from which it was exceedingly difficult to dislodge them. The only note we heard them utter was given in a low tone, and was somewhat similar to the commonest call of *C. albiloris*. I saved the stomachs of the birds obtained, together with those of several other species, which will be dealt with at a later date. The type specimen of this species was obtained at Kow Plains two years previously by Messrs. J. A. Ross and F. E. Howe, and it was named by Mr. Gregory Mathews from the single specimen.

Cinclorhamphus cruralis. Brown Song-Lark.—One specimen only was seen at Kow Plains, where in some seasons they are said to be plentiful.

Ephthianura albifrons. White-fronted Bush-Chat.—This was another old friend which we saw in the open country east of Ouyen.

Acanthiza apicalis (?) Broad-tailed Tit.—An *Acanthiza* having decided leanings towards the Western Australian form. *A. apicalis* was obtained on the dense tea-tree covered sand-ridge south of Kow Plains, where four specimens were obtained. The Mallee specimens all had bright red irides, while *A. pusilla* always has rich brown. Again, the notes of the Northern bird are totally distinct from *A. pusilla*.

Acanthiza pyrrhopygia. Red-rumped Tit.—We only met with this bird on three occasions at Kow Plains, and did not see it at all at Ouyen.

Acanthiza uropygialis. Chestnut-rumped Tit.—This Tit is found wherever the timber is sufficiently large to contain suitable holes for nesting purposes. Several nests were found, one of which was close to Ouyen railway station.

Acanthiza chrysorrhoa. Yellow-rumped Tit.—Was often seen in the Murray pine country around Kow Plains.

Sericornis brunnea. Redthroat.—In some low scrubby country, close to Ouyen, we met with and obtained a specimen of this quaint little bird.

Malurus melanonotus. Black-backed Wren.—The beautiful plumage of this and the following species is one of the first things to catch the eye of the ornithologist visiting the Mallee. Although occasionally found in the porcupine-grass country, it usually inhabits the turpentine-bush and low scrubby growths of the flats, where it is a very common bird. Several skins showing the interesting changes of plumage of the male bird were secured. A sharp look-out was kept for their nests, but we were too early, only one partially-built nest being found.

Malurus assimilis. Purple-backed Wren.—Might be described as "the gem of the porcupine grass," where it is always seen, darting in and out of the great tufts in search of ants and other small forms of insect life. At the time of our visit they were still in flocks, about a dozen birds being the usual complement. In a flock of this dimension I usually saw two adult males and two or three others in varying stages of maturity. The reddish line near the eye of the female of this species is not so bright as in the case of *M. melanonotus*, but otherwise it is almost impossible to distinguish between them.



Porcupine-grass or spinifex.

FROM A PHOTO. BY A. H. E. MATTINGLEY.

Stipiturus mallee. Mallee Emu-Wren.—One of the objects of our trip was to bring to light the hitherto undescribed female* of this species, and we succeeded in coming back with six skins, besides several skins of the little-known male bird. Wherever a thick belt of porcupine grass grew there would this dainty little bird be found if great patience and care were exercised. They have a very faint call-note—fainter, indeed, than that of *S. malachurus*, and it is only on calm days that it may be heard. In windy weather they seldom show themselves, feeding low down in the porcupine grass. When surprised in an isolated tuft they are very loth to leave it, and we sometimes kicked a large tuft to pieces, and jumped upon it till we were tired, before succeeding in dislodging them. In fact, when the first nest and eggs were obtained by Messrs. Geo. Dunn and F. Estick (see paper by F. E. Howe, *Emu*, vol. x., p. 336), they were only apprised of the bird's presence in the tussock when half of it had been burnt. About 2 miles north of the boring camp where we stayed there is a large expanse of porcupine-grass country, interspersed with small mallee gum saplings and acacia. It was here that we found the Emu-Wrens to be very plentiful. We were too early to get eggs, but found four nests building, besides several old ones. Most of these were placed in the heart of the porcupine tussocks. In two cases, however, the grass had grown in the form of a horse-shoe, the nests being placed on the edge of the inner side, being thus easily discernible without disturbing the tussock. The interior of one nest was beautifully lined with rabbit's fur and white feathers. On calm, hot days these little creatures would mount to the top of a porcupine clump or small melaleuca and give utterance to their faint squeaking notes.

Amytornis striatus. Striated Grass-Wren.—This bird, to which Mr.

* Since described in *Emu*, vol. xi., p. 247—EDS.



Red-throated Thickhead (*Pachycephala gilberti*)—female—at Nest.



Nest of Red-throated Thickhead (*Pachycephala gilberti*).

Gregory Mathews has lately applied the specific name of *A. striatus howei*, was always associated with the foregoing species, and, although considerably larger, was almost as difficult a bird to obtain. Being of an extremely shy nature, and possessed of great running powers, it soon disappears from sight amongst the tussocks. It is, however, very curious, and on hearing a strange noise cautiously mounts some spot of vantage to find out from whence it comes. We obtained several skins, and were also fortunate in finding two nests containing eggs. The nest, although well hidden, is usually visible from the outside of the tussock, but occasionally nests were found in the centre.

Artamus superciliosus. White-browed Wood-Swallow.—Frequently seen around Ouyen and the Kow Plains district.

Artamus tenebrosus. Sordid Wood-Swallow.—A large flock, flying very high, of this species was seen at Kow Plains.

Collyriocichla harmonica. Harmonious Shrike-Thrush.—Was common throughout the country traversed, and one nest containing eggs was found in a discarded Babbler's nest.

Grallina picata. Magpie-Lark.—This bird is rare in the Mallee parts visited, being only noted on one occasion.

Gymnorhina tibicen. Black-backed Magpie.—In the open country at Ouyen and Kow Plains many nests of these birds were observed.

Cracticus destructor. Butcher-Bird.—Many nests of this species in course of construction, and one or two containing eggs, were located.

Oreocia cristata. Crested Bell-Bird.—These quaint birds were met with frequently in all the country traversed, and their curious caterpillar-decorated nests often seen. Where a nest was placed in a tea-tree bush, there were invariably found the remains of three or four previous nests. One nest found was built in the hollow spout of a stump. The ventriloquial power this bird possesses is indeed wonderful, and often very confusing to the uninitiated.

Pachycephala meridionalis. Mallee Thickhead.—This Thickhead, which Mr. A. J. North described, frequented a densely scrubbed sand-hill, south of Kow Plains, where it associated with the Red-throated species, *P. gilberti*. Although possessing the same habits and calls as *P. pectoralis*, its nest is somewhat differently constructed, being beautifully decorated with green lichen. The nests found were all placed in thick growths of the parasitical dodder, and were lined with the fine needles of a species of casuarina growing close by.

Pachycephala rufiventris. Rufous Thickhead.—A few specimens of this species were seen near Kow Plains.

Pachycephala gilberti. Red-throated Thickhead.—Was met with in most parts of the country visited, but was particularly plentiful south of Kow Plains. Curiously enough, every nest found was built upon the top of a Babbler's old nest. The nests were very deep, and lined with fine rootlets and casuarina needles.

Aphelocephala leucopsis. Whiteface.—Common throughout the country visited.

Neositta pileata. Black-capped Tree-runner.—A few birds of this species were sometimes seen around our camp.

Climacteris picumna. Brown Tree-creeper.—This Tree-creeper, which is slightly larger in the bill than the southern birds, was frequently met with in the open country, and their nests were occasionally found. The eggs (two) of one clutch secured are remarkable on account of their size, being half as large again as those usually met with.

Dicaeum hirundinaceum. Mistletoe-Bird.—A solitary specimen of this sylvan gem was observed at Ouyen, where we noticed a few mistletoes growing.

Pardalotus ornatus. Red-tipped Pardalote.—Common everywhere, the birds having just started nesting operations.

Pardalotus xanthopygius. Golden-rumped Pardalote.—This pretty little form was always present on the sand-hills, where many of them had started nesting. At Ouyen nests were found containing incomplete clutches, but at Kow Plains they were not so forward, having just started tunnelling. Several of their excavations were noticed along the tracks that do service as roadways. Their bell-like note is exactly similar to that of *P. punctatus*, but not quite so loud.

Melithreptus brevirostris. Brown-headed Honey-eater.—Another familiar friend that we frequently met; although differing but very slightly from the southern representative of the species, it is not of such a stout build.

Plectorhamphus lanceolatus. Striped Honey-eater.—A few pairs were seen amongst the pine clumps near the Kow Plains homestead.

Glycyphila melanops. Tawny-crowned Honey-eater.—When searching for nests of *Amytornis* we often found nests of these birds built upon the top of the porcupine grass. One clutch taken from a nest built in a turpentine-bush was unusual in being perfectly white.

Glycyphila albifrons. White-fronted Honey-eater.—Seen in great numbers in the Kow Plains district, where many nests containing eggs and young were found. They nested freely in the turpentine-bushes, but the most favoured site was on the top of a porcupine-grass tussock. In the latter case there was always a small sapling close to the nest upon which they alighted before going to the nest.

Ptilotis sonora. Singing Honey-eater.—A few pairs were located in the pine clumps near the homestead.

Ptilotis novae-norciae. (Milligan). I obtained two skins at Kow Plains which I think must be referable to this Western Australian species. It will, however, be necessary to get more skins to ascertain if the differences are constant. Three clutches of eggs were obtained, which are considerably smaller than those met with in southern Victoria. Both Mr. Howe and myself also noticed that the call notes of this bird were not so loud as those we were accustomed to hear of *P. leucotis*.

Ptilotis cratitia. Wattle-cheeked Honey-eater.—This very distinct bird was seen on one or two occasions in the neighbourhood of the boring camp.

Ptilotis ornata. Yellow-plumed Honey-eater.—This graceful Honey-eater was observed in numbers throughout the trip, and nests containing both eggs and young in various stages of maturity were discovered.

Myzantha melanotis. Black-eared Miner.—This new species (see *Emu*, vol. xi., page 124), which closely resembles *M. obscura*, of Western Australia, was fairly common in the neighbourhood of the boring camp, one flock in particular often being seen feeding just close to our tent doors. Their notes and general habits are not unlike those of *M. garrula*. We were too early to obtain eggs, but a nest being built was found when tracking back to Kow Plains from the camp. The female is similar to the male, but is slightly smaller.

Acanthochæra carunculata. Red Wattle-Bird.—Although not common, a few pairs of Wattle-Birds were seen in most places visited, and nests containing eggs noticed.

Acanthogenys ruficularis. Spiny-cheeked Honey-eater.—Occasionally seen near the soak, a few miles north of the camp.



Spiny-cheeked Honey-eater (*Acanthogenys ruficularis*) and Nest.

Anthus australis. Pipit.—Common in the open country.

Corone australis. Raven.—This scavenger was always with us, and we often disturbed them from a repast of dead rabbit. Several nests, some containing eggs, were observed.

Strepera melanoptera. Black-winged Crow-Shrike.—This splendid bird was not often encountered, and its timidity rendered it exceedingly difficult to approach. A nest in course of construction was found near the bore by Mr. H. Scarce, but was not ready for eggs before we left camp.

Corcorax melanorhamphus. White-winged Chough.—A common bird through the Mallee, where it is usually known as the Black Magpie.

Kangaroo Island Reserve.

By J. W. MELLOR, R.A.O.U., ADELAIDE.

KANGAROO Island, in South Australia, is an ideal place on which to form a national reserve, but the State Government appears to be unwilling to set aside a large area at the extreme western end of the island, at Cape Borda, where the native fauna and flora could be protected. A small reserve has been made, but the larger area is necessary.

The South Australian Ornithological Association procured several pairs of Mallee-Fowl (*Lipoa ocellata*), which were liberated by me at Cape Borda on 23rd February, 1912. While engaged in this work I was enabled to make interesting observations on the avifauna of the country immediately surrounding the Cape Borda lighthouse. The locality is wild and rugged; precipitous cliffs stretch for miles along the coast, and the summits support trees and plants whose appearance illustrates the force of the gales which at times beat upon the shore. Further inland there are sheltered spots where the timber is larger. But, on the whole, the area is rocky and rugged, and unfit for agricultural purposes.

The first bird I saw after landing from a boat belonging to the *Governor Musgrave*, the departmental steamer which conveyed me to the island, was the Kangaroo Island form of the Crescent Honey-eater, designated by Mr. A. G. Campbell as *Meliornis halmaturina*. Its loud, clear note rang through the early morning air from some thick scrub in a sheltered ravine to the east of Harvey's Return, which is the landing-place for Cape Borda. On the open land above I made the acquaintance of the Red-rumped Ground-Wren (*Hylacola cauta*), which was threading its way through the low, stunted bushes. Ever and anon, half hopping, half flying, it crossed an intervening piece of bare ground.

On arrival at the lighthouse quarters, some 3 or 4 miles distant, my attention was directed to a number of imported Sparrows which were falling, almost helplessly, into a thick bush. I soon discovered the cause. A Sparrow-Hawk (*Accipiter cirrhocephalus*) had flown on to the high pole of a bush fence, and in a flash it swooped down into the bush and carried off a Sparrow.

Through the kindness of Mr. W. O. Wood, the head light-keeper, and his wife, I was accommodated at their cottage for

the night. Next morning I explored the country. Near a small water catchment and trough I observed a number of species of small birds; they were principally of the honey-eating family. A conspicuous form was the White-bearded Honey-eater (*Meliornis novæ-hollandiæ*), commonly known as the "Yellow-wing." A bird of quick flight and sprightly motion was the Kangaroo Island form of the Spine-bill Honey-eater (*Acanthorhynchus halmaturina*). Like a dart from an air-gun it would come upon the scene, dip into the water and out again, then perch upon some convenient twig for a few seconds to plume its feathers before flying again into the scrub. The Crescent Honey-eater was also there, having its bath, with several of the local form of the White-eye (*Zosterops halmaturina*). In some trees close by I noted the Wattle-cheeked Honey-eater (*Ptilotis cratitia*), which came from its cover now and again, but was not so tame and confiding as the other species. A eucalypt was in flower, and in this a number of Honey-eaters had congregated, but upon the approach of two Wattle-Birds (*Acanthochæra carunculata*), which were in a quarrelsome mood, the smaller birds flew off.

From a neighbouring scrub came the loud, ringing call—"Cling-cling-cling"—of the Black-winged Crow-Shrike (*Strepera melanoptera*). I was able to get a good view of them, one coming close to me and perching on a dry limb of a tree, where it called to its mate in the scrub a few hundred yards away. On the "black-boy" country—and there was plenty of this arid-looking land in the reserve—I came across the Tawny-crowned Honey-eater (*Glycyphila melanops*). This solitary bird delighted to perch on the top of a grass-tree flower (*Xanthorrhœa*) or some dry twig. In some low bushes the twitter of a Wren (*Malurus*) caught my ear, and soon several sombre-coloured females came hopping along. Their identity was not clear until the bright blue and black uniform of the male bird was seen a few minutes later. The species was *Malurus cyaneus* of the mainland, whose useful and confiding habits are so well known in the rural districts. Other birds were present, but, the time being short, only a hurried inspection was possible, and I was reluctantly compelled to return to the lighthouse quarters, where my kind host and his wife again attended to my needs. I was driven to Harvey's Return, where I caught the *Governor Musgrave* on her homeward voyage to Port Adelaide.

While on the reserve I was impressed by the fact that the coast-line appeared to be ideal for sea-birds. Gulls of several species, Penguins, Terns, and Skuas were seen in numbers; also other familiar species. I was highly pleased at having had the opportunity of inspecting the reserve, if only for a brief time, and my thanks are due to the President of the Marine Board, Mr. Arthur Searcy, for courteously granting a passage and assisting me in every possible way.

Bird-Life near Home.

By THOS. P. AUSTIN, R.A.O.U., COBBORA, N.S.W.

It is wonderful how quickly birds find out protected localities. While sitting upon my verandah for about half an hour one afternoon, it occurred to me to make a note of the species which came into my small flower garden in front of the house. Only a few yards away were three Rosella Parrots (*Platycercus eximius*) and two Parrakeets (*Psephotus hæmatonotus*) feeding on the berries of an African boxthorn bush, while hovering around within a few feet of my chair was a pair of Restless Flycatchers (*Sisura inquieta*). A pair of Black-and-White Fantails (*Rhipidura tricolor*) was busy feeding young, which had only a few days ago left the nest, built under the verandah in a grape vine. Then came along a very proud pair of Blue Wrens (*Malurus cyaneus*), with three very tiny young birds, which had left the nest, built in a creeper on the side of the house, only that morning. Two Honey-eaters (*Ptilotis penicillata*) were feeding in the grape vines 4 feet above my head, while a pair of Magpie-Larks (*Grallina picata*) were flying to and from a small dam about 80 yards away in front of the house and a yellow box tree in the back yard, where they had a nest and young.

In the orchard at the side of the house was the nest of a pair of Yellow-rumped Acanthizas (*A. chrysorrhoa*), and in a peach tree a few yards away a Spotted-sided Finch (*Staganopleura guttata*) was busy with incubation duties. The next to put in an appearance was a beautiful little male Mistletoe-Bird (*Dicaeum hirundinaceum*), then a small flock of Chestnut-eared Finches (*Tæniopygia castanotis*). Not far away, outside the garden fence, were several Magpies (*Gymnorhina tibicen*) hunting for food, and a knowing old Raven (*Corone australis*), probably on the look-out for an egg of one of my Bronze Turkeys.

During the last two seasons many species of birds were observed breeding within a quarter of a mile of my house. At the dam in front of the house *Microtribonyx ventralis* and *Hypotaenidia philippinensis* were studied. The young of these two species running along the edge of the water much resembled black mice. In the water, attached to the drooping branches of willow trees, were the nests of the Grebe (*Podiceps novæ-hollandiæ*). Some few years ago, when there was only one pair of these birds here, the nest was robbed, and six days later the birds had a new nest built and the first egg was in it. They sat upon their eggs throughout the day, only leaving it when disturbed. Their young, until able to feed themselves, were very noisy. There were always a few pairs of the Black-fronted Dottrel (*Ægialitis melanops*) about the edge of the dam. Last year a bird was sitting on a nest on the edge of the buggy road, just outside the garden gate, 12 yards from the verandah. Unfortunately, a horse trod upon the eggs.

On the other side of the garden a pair of Warty-faced Honey-

eaters (*Meliphaga phrygia*) was very busy feeding their young in a nest built in a small box-tree, and a few yards further on a pair of Ground Cuckoo-Shrikes (*Pteropodocys phasianella*) had been breeding for years. The young of these birds remained with their parents for at least twelve months, often being about the nesting locality during the whole year. Four seasons ago I was driving through open forest country, when I saw two Cuckoo-Shrikes fly from a tree, and found on the same branch two of their nests, within 3 feet of each other (young birds in each nest). Five adult birds were attending to the nestlings' wants. The following year I closely watched a pair of birds which nested near my house. They built in exactly the same spot as in the previous season. The three young birds took possession of an old Magpie-Lark's nest in a tree near by, and in it one of them deposited three eggs. The Grallinas had built a new nest in the same tree, and another pair had theirs in an adjoining tree. In other trees in the neighbourhood the following species were found breeding:—*Ptilotis penicillata*, *Myzantha garrula*, *Acanthochara carunculata*, *Entomyza cyanotis*, *Tropidorhynchus corniculatus*, *Philemon citreigularis*, *Pomatorhinus frivolus*, *Coracina robusta*, *Gymnorhina tibicen*, *Artamus superciliosus*, *Artamus tenebrosus*, *Climacteris picumna*, *Lalage tricolor*, *Sisura inquieta*, *Aphelocephala leucopsis*, four species of Parrots, and seven other species which build upon the ground.

“The Austral Avian Record.”

The Austral Avian Record, No. 2, vol. i., has been published.* It purports to contain the names (trinomials, except in one instance) of over 200 new forms or sub-species of Australian birds.

The additions have been made chiefly through the re-examination (after having passed such an expert as Professor Collett) of a collection made by Dr. Dahl, of Norway, in the Northern Territory some years ago, a large collection made by Mr. J. P. Rogers for Mr. Mathews on Melville Island, and a valuable gratuitous collection made more recently by Capt. S. A. White on Kangaroo Island, and elsewhere in South Australia.

As John Gould was known in his day, on account of his magnificent folio works, as the “pictorial” ornithologist, so Gregory Mathews may certainly be designated the “sub-specific” author, for his method in very minutely subdividing the Australian avifauna.

Fortunately, Mr. Mathews is editor of his own *Record* (without its wrapper there would be no name or authority for the articles contained)—an organ responsible to no society or union. If the multiplication of new forms be correct, then Australian ornithology obviously must be in a very primitive state, but should the differentiation of all known Australian birds on authoritative

* No. 1 was noticed in *The Emu*, vol. xi., p. 260.

lists and catalogues be fairly up to date, then the introduction of Mr. Mathews' subdivisions will undoubtedly tend to lead students to endless confusion.

For instance, take Mr. Mathews' attempt to unravel the Crows, which, according to such an undoubted expert as Mr. Ogilvie-Grant, has only led to greater confusion (*vide* p. 44, this issue).

As this magazine (*The Emu*) stands primarily to "popularize the study of native birds," it must be true to its objects and warn students and bird-lovers not to be misled by Mr. Mathews' mazes of subdivisions, which in many cases can only prove individual or local variation. Were not Gould, Ramsay, Legge, North, and other Australians good at discriminating species and forms? How have they all passed so many of Mr. Mathews' discoveries? And Drs. Sharpe and Gadow and the other talented authors of the official "Catalogue of Birds" of the British Museum—did they not handle and examine much Australian material, including most of Mr. Mathews' so-called "new forms"?

There may be license for numerous sub-species, and possibly species, in a new and ornithologically unexplored insular region like Melville Island, Northern Territory, but what excuse is there for creating new sub-species for a number of common birds found within the railway suburban radius of the metropolis of Melbourne, where so many ornithologists of good standing have been born and reared. The following may be cited as instances:—*Dacelo gigas* (*tregellasi*), *Petræca leggii* (*frontalis*), *P. cucullata* (*vigorsi*), *Smicrornis brevirostris* (*viridescens*), *Pachycephala gutturalis* (*youngi*), *Cinlosoma punctata* (*neglectum*), *Psophodes olivaceus* (*scrymgeouri*), *Oreocincla lunulatus* (*dendyi*), *Acrocephalus australis* (*mellori*), *Megalurus gramineus* (*wilsoni*), *Chthonicola sagittata* (*inexpectata*), *Sericornis frontalis* (*harterti*), *Acanthiza chrysorrhoa* (*sandlandi*), *Malurus cyaneus* (*henriettae*), *Collyriocincla harmonica* (*victoriae*), *Falcunculus frontatus* (*iredalei*), *Cracticus torquatus* (*olindus*), *Pardalotus striatus* (*sub-striatus*), *Ptilotis leucotis* (*depauperata*), *P. penicillata* (*mellori*), *Acanthochæra carunculata* (*tregellasi*), *Egintha temporalis* (*tregellasi*), *Corcorax melanorhamphus* (*subniger*), &c.; while it is incautious to give new names to such well-known species migrating to Victoria as *Meliphaga phrygia* (*tregellasi*), *Myiagra rubecula* (*ringwoodi*), *Rhipidura rufifrons* (*inexpectata*), &c.

Mr. Mathews is an Australian by birth, but it is not known whether or not he followed ornithology in his native land. In any case it is evident that he should study his Australian geography practically before proceeding further with his work. No person can write successfully the ornithology of a country from a distance, or from cabinet specimens alone. Even a Gould could not have done it. For this reason it is a pity that Mr. Mathews has completed the first volume of what promised to be a standard work before he visited Australia and acquired indispensable local knowledge. While mentioning Mr. Mathews' work, and taking into consideration the position of the R.A.O.U. regarding Australian ornithology, it is remarkable that not one of the

five parts (the last issued eight months ago) published of his "Australian Birds" has been sent to the Union for review. Does he object to have his work judged from an Australian standpoint? There are no persons more interested in the birds of their own continent than Australians themselves.

The reviewers of this *Record* regret having occasion to use such direct criticism, but in the common interests of Australian ornithology they feel impelled to do so, and in doing so have the entire approval of their Council.

However, Mr. Mathews has recorded for the first time for the Commonwealth a bird of much interest to Australians—namely, the Broad-billed Sandpiper (*Limicola sibirica*, Dresser). There is in the Tring Museum a female collected by Mr. J. P. Rogers at Broome, North-West Australia. According to Seebohm* this Sandpiper is very local during the breeding season (breeding on the Scandinavian mountains and other northern localities), but its range extends from the Atlantic to the Pacific. In the Austro-Malayan region its farthest south has been Java.

The Crows of Australia.

The Bulletin of the British Ornithologists' Club, No. clxxvi., contains the following critical statement by Mr. W. R. Ogilvie-Grant, of the bird department, British Museum, which is of especial interest to Australians:—

"In a paper just published in the *Novitates Zoologicae*, xviii., pp. 442-3 (1912), Mr. G. M. Mathews has given a Reference List to the Birds of Australia, in which he divides the Raven, Crow, and Jackdaw into no less than ten different forms, seven of these being named for the first time: thus adding to the confusion which already existed. He, unfortunately, failed to recognize the true specific differences between the Raven and the Crow, and misapplied the name *C. bennetti* to smaller specimens of the latter. I am glad to say that he now entirely agrees with me on all the main points at issue concerning the Australian *Corvidæ*, and their synonymy, as given below.

"1. **The Raven.** *Corvus coronoides*, Vig. & Horsf.

"? *Corvus australis*, Gmel. S. N. i. p. 365 (1788) [ex Lath. Gen. Syn. i. pt. i. p. 369 (1781)].

"*Corvus coronoides*, Vig. & Horsf., Trans. Linn. Soc. xv. p. 261 (1827) [Parramatta, New South Wales]; Gould, Birds Aust. iv. pl. xviii. (1848) [Tasmania]; Ramsay, *Ibis*, 1865, p. 303 [part.]; Sharpe, Cat. Birds B. M., iii. p. 20 (1877) [part.]

"*Corvus australis*, Gould, Handb. Birds Austr. i. p. 475 (1865) [part.]; Ogilvie-Grant, *Ibis*, 1909, p. 652 [Albany, S.W. Australia].

"*Corone australis*, Sharpe, Cat. Birds B. M. iii. p. 37 (1877);

* "Geographical Distribution of the Charadriidæ," p. 433.

North, Nests and Eggs Birds Austr. i. p. 187, pl. vii. fig. 7 (1889); Campbell, Nests and Eggs Austr. Birds, i. p. 55 (1901); North, Nests & Eggs Birds Austr. i. p. 5 (1901).

"*Corvus coronoides coronoides*, Mathews, Nov. Zool. xviii. p. 442 (1912) [Type: New South Wales].

"*Corvus coronoides perplexus*, Mathews, t. c. p. 442 [South-west Australia].

"*Corvus marianæ marianæ*, Mathews, t. c. p. 443 [New South Wales].

"*Corvus marianæ mellori*, Mathews, t. c. p. 443 [Victoria, South Australia; South-west Australia].

"*Corvus marianæ halmaturinus*, Mathews, t. c. p. 443 [Kangaroo Island].

"*Corvus marianæ tasmanicus*, Mathews, t. c. p. 443 [Tasmania].

"2. **The Crow.** *Corvus cecilæ*,* Mathews.

"*Corvus australis*, Gould, Handb. Birds Aust. i. p. 475 (1865) [part.]

"*Corvus coronoides*, Ramsay, *Ibis*, 1865, p. 303 [part.]; Sharpe, Cat. Birds B. M. iii. p. 20 (1877) [part.]; North, Nests & Eggs Birds Austr. i. p. 186, pl. vii. fig. 8 (1889); Campbell, Nests & Eggs Austr. Birds, i. p. 54 (1901); North, Nests & Eggs Birds Austr. i. p. 1 (1901); Ogilvie-Grant, *Ibis*, 1909, p. 652 [Southern Cross; Koolgardie and Gascoyne R., West Australia].

"*Corvus coronoides cecilæ*, Mathews, Nov. Zool. xviii. p. 442 (1912) [North-west Australia].

"*Corvus bennetti bennetti*, Mathews (nec North), t. c. p. 442 [New South Wales; South Australia].

"*Corvus bennetti queenslandicus*, Mathews, t. c. p. 443 [Queensland].

"3. **The Small-billed Crow, or Jackdaw** *Corvus bennetti*, North.

"*Corvus bennetti*, North, Victorian Nat. xvii. p. 170 (1901) [Moolah, western New South Wales]; Ogilvie-Grant, *Ibis*, 1909, p. 650 [Carnarvon, Gascoyne R., West Australia].

"*Corvus bennetti bonhoti*, Mathews, Nov. Zool. xviii. p. 442 [Murchison, West Australia].

"The colour of the iris does not seem to be of any value as a specific character. In fully adult examples of all three species it appears to be white."

Stray Feathers.

Description of Eggs of Lesser Yellow-faced Honey-eater (*Ptilotis sub-chrysope*), *Emu*, ante, p. 19).—In form pointed ovals, though somewhat swollen. Surface of shell fine and slightly glossy. Ground colour pinkish-buff, spotted and lightly blotched, particularly at the larger ends, where irregular zones occur, with two

* Through the confusion existing in ornithological works, Mr. Ogilvie-Grant is of opinion that this is the only name available.—Eds.

shades of reddish-brown and a few markings of dull purplish-grey, the latter appearing as if beneath the surface of the shell. The pair of eggs measures in inches :—(a) 0.77 x 0.55, (b) 0.77 x 0.53. They were taken for me by Mr. Roy Hislop, near Cooktown, North Queensland, on 25th November, 1909, and the parents were forwarded with the eggs.—H. L. WHITE. Belltrees, 2/6/12.

* * *

Description of Nest and Eggs of Western Emu-Wren (*Stipiturus westernensis*), (*Emu*, vol. xi., p. 223).—*Nest*.—Dome-shaped, but not completely hooded. Total length, 5 inches; breadth, 3 inches; depth inside, from lower edge of entrance, 2 inches; diameter of entrance, 1 inch. Composed outwardly of long, narrow strips of thin bark, which are soft and much weather-worn, matted together with cobwebs and the green egg-bags of spiders. Lining consists of fine grass, a few feathers, and a quantity of short brown silken, hair-like stems, which are neatly worked into the front portion. *Eggs*.—Swollen ovals in shape; surface of shell fine, but without gloss. Ground colour dull white, over which are scattered spots and specks of dark and light reddish-brown and pale umber. In (a) these markings are more confined to the larger end, while in (b) they are more closely set together at the smaller end. The pair of eggs measures in inches :—(a) 0.65 x 0.48, (b) 0.63 x 0.48. Taken by Mr. F. Lawson Whitlock for me at Wilson's Inlet, S.W., Western Australia, on 11th November, 1911. The eggs were much incubated. Female was flushed from nest, which was placed low down in long, coarse grasses.—H. L. WHITE. Belltrees, 5/4/12.

* * *

Occurrence of *Myzantha melanotis*, Wilson, near the Murray, S.A.—On the 5th January of this year I spent a day in the mallee, about 5 miles east of Schwetze's Landing, 11 miles above Marmion, on the Lower Murray. I found the above-mentioned species in exactly the same patch of mallee in which I met with it in January last year (1911). My friend, Mr. G. Mann, told me then (in January, 1911) that the Miner in the mallee was in his opinion distinct from the species frequenting the large red gums (*Eucalyptus rostrata*) growing along the banks of the river. He stated that some of the notes were distinct, and that the mallee species was much more active on the wing than the other—he had watched them catching insects on the wing. Although I saw the bird in January, 1911, and tried to get within shot, I did not succeed in obtaining one, my friends being in a hurry to get home with their teams. This year I saw nothing of the bird until we were on the return journey, when, at the same spot, I heard them calling, and secured one. I agree with previous writers that it is nearly allied to the Western Australian species, *M. obscura*, though distinct therefrom. I believe the locality where Captain S. A. White met with it was about 40 miles back from the Murray. The next morning I shot a specimen of *M. garrula* on the

river frontage for comparison of measurements, &c., as follows :—*Myzantha garrula*, shot Schwetze's Landing, 6/1/12.—Total length, 11 inches; wing, $5\frac{1}{2}$ inches; culmen, 1 inch; tarsus, $1\frac{1}{2}$ inches. Iris dark brown; feet, upper side brownish-yellow; bare skin behind eye yellow; eyelid white. *Myzantha melanotis*, shot 5/1/1912.—Total length, 10 inches; wing, $4\frac{1}{4}$ inches; culmen, $1\frac{1}{16}$ inches; tarsus, $1\frac{1}{8}$ inches. Iris grey-brown; feet brown; bill dark yellow; bare skin behind eye, and upper and lower eyelids, yellow.—EDWIN ASHBY. Blackwood (S.A.), 13/3/12.

* * *

Birds of the Mallee near Schwetze's Landing, River Murray, S.A., observed 5th January, 1912.—The locality under observation is about 5 miles east of the Murray. In a narrow strip of standing mallee only 6 chains wide, between two wheat paddocks cropped this season, the Mallee-Fowl (*Lipoa ocellata*) had made a nest in the early spring, and from the recent scratching it was evident that at this late date there were eggs in the mound still undergoing incubation. One of the birds was seen by some of our party feeding in the stubble near the scrub. We examined a large excavation, a foot or so deep, that had been scratched out by the birds in the spring and then deserted for the place above referred to. My friends, who had often seen the birds, could assign no reason for the desertion of the first position; probably it had to do with the hardness of the subsoil, or some obstruction met with. A good deal of the mallee was in flower, and had attracted great numbers of White-fronted Honey-eaters (*Glycyphila albifrons*) and a fair number of its near relative—*G. fulvifrons*. The varied cries and whistling notes of these two species, chiefly the former, filled the scrub with lively sounds. Single specimens of the Red-rumped Ground-Wren (*Hylacola canta*) were seen from time to time running quickly across small open spaces between the thick undergrowth. In these rapid runs the tail was often not carried erect, whereas when moving amongst the stems of the bushes it was always erect. The Red-rumped Tit (*Acanthiza pyrrhopygia*) was fairly common, but its allied species, *A. uropygialis*, so common in the more open mallee near the river, was not met with here. In the larger blocks of mallee the low warning whistle of the Scrub-Robin (*Drymaedus brunneipygius*) was heard. As one moved quietly through the bushes the birds would allow one to approach very closely. While keeping themselves more or less hidden from the observer's view by the mallee-stems, their large black eyes might be caught staring at the intruder with curiosity. The Chestnut-backed Ground-Bird (*Cinclosoma castanonotum*) was fairly numerous, running for long distances in preference to flying, but keeping the stems of bushes between itself and its pursuer. The flute-like notes of the Bell-Bird (*Oreoica cristata*) were heard several times during the day, and one specimen was unintentionally shot. The specimens of the Brown-headed Honey-eater (*Melithreptus brevirostris*) obtained were very bright green on the back;

whether or not there is an exceptionally green strain inhabiting the Mallee, I was unable to determine. The White-faced Honey-eater (*Ptilotis leucotis*) and the Yellow-plumed Honey-eater (*Ptilotis ornata*) were both very numerous. A specimen of *Strepera melanoptera* (evidently this year's bird) shot showed a very distinct white patch on the wings, common to the allied species, *Strepera fusca*. It is possible that these mallee birds are intermediate between the two forms. Of Parrakeets, *Barnardius barnardi* and *Calopsittacus novæ-hollandiæ* were both met with—of the latter a large flock. The Yellow-rumped Pardalote (*Pardalotus xanthopygius*) was present, but not numerous.—EDWIN ASHBY. Blackwood (S.A.), 13/3/12.

* * *

West Devonport (Tasmania) Notes.—This autumn has been remarkable for the great number of Robins which have frequented our paddocks and gardens. Every autumn this movement towards the towns and villages takes place, but the numbers seem greater than ever this season, especially of the beautiful Flame-breasted species (*Petræca phænicea*), which far outnumber the Scarlet-breasted (*P. leggii*). As remarked in former notes, the Flame-breasted Robins gather into flocks at the approach of autumn, while *P. leggii* remains in pairs throughout the year. My friend Mr. H. C. Thompson, of Launceston, agrees with me in thinking that the male Flame-breasted Robin in full plumage is the brightest and loveliest bird in our State. He says, in a recent letter:—"We saw a number of them at the Third Basin, South Esk River, in a rocky paddock. As they stood on the round, dark boulders with the afternoon sun reflected from their glowing breasts, they looked splendid indeed." No doubt it was this fondness for rocky ground which caused the name *Petræca*, or "rock-frequenter," to be given to the genus. We have plenty of this species with us still in the second week of June. I am not with those who believe that the birds leave our shores for the mainland at the approach of winter.* The Flame-breast is always with us.

The Wood-Swallows (*Artamus sordidus*) always gather in some paddocks near the beach about the autumn equinox. There numbers remain, taking short flights from fences and trees, until a cold snap comes in April to drive them northward. This year the compelling force arrived during the fourth week of April, when not only the Wood but also the Welcome Swallows (*Hirundo neoxena*) cleared off in a body, nor have I seen one since. The Pipits (*Anthus australis*) seem to have left at the same time, also the remainder of the Pallid (*Cuculus inornatus*) and Fan-tailed Cuckoos (*Cacomantis rufulus*); but on 16th May I noticed one

* Recently a "Nature Note" published in *The Argus* stated that some observers, while fishing in the neighbourhood of Port Phillip Heads, noticed a flock of Flame-breasted Robins flying over the sea. There was no doubt the birds were heading inland. But where did they come from?—EDS.

pair of Pipits in a newly-ploughed paddock, and on the 18th again, at the same place, feeding in company with White-fronted Chats (*Ephthianura albigrons*) and Robins. During last week also I noted a solitary Pipit on two occasions, so that a few stragglers have remained, as usually happens. Mr. H. C. Thompson heard a Fan-tailed Cuckoo (*Cacomantis rufulus*) calling on 19th May, near Launceston, but on the coast none has been observed by me since April.

The White-bearded Honey-eater (*Meliornis nova-hollandiæ*) frequents the Cape wattle of our gardens during the winter season, and, as this tree is now in full bloom, it presents a scene of great animation in the day, with the lively movements of this fine species, sometimes chasing away a Spinebill (*Acanthorhynchus tenuirostris*) or a Fantail (*Rhipidura diemenensis*), or dashing through the branchlets after one of its own kin. There is a male in splendid plumage which sits on the topmost twig of a weeping willow that adjoins the wattle in the early morning sunshine, from which point of vantage he makes frequent sallies to catch insects, which begin to fly as the sun's warmth moves them.

While in a clump of small bush in the middle of May I noticed a party of Strong-billed Honey-eaters (*Melithreptus validirostris*), a species I had not seen about Devonport for a considerable time. The birds were engaged in running up the stems and branches of small gums, hunting for insects and spiders under the loose bark, and looked very engaging with their black caps and white neck-rings.—H. STUART DOVE. 8/6/12.

Forgotten Feathers.

LEWIN, "BIRDS OF NEW HOLLAND, 1808."

BY GREGORY M. MATHEWS, F.R.S.E.

IN 1808 there was published by J. White, Fleet-street, a book on Australian ornithology, its full title being :—

"Birds/of/New Holland/with their/Natural History/Collected, engraved, and faithfully painted after nature/by/John William Lewin, A.L.S./of Parramatta, New South Wales./ Vol I/ London/printed for the Author;/and published by/J. White, Fleet Street; and S. Bagster, 81 Strand/1808/ The letter-press by T. Bensley, Bold Court."

This work contained 22 pages of letter-press and 18 plates. The plates (except No. 9), published as the Act directs, have a date (different days of March, 1808), and "J. W. Lewin, New South Wales." They are numbered with Roman numerals, except plates 3 and 15, which are in Arabic figures.

At the head of the letter-press to each plate is a Latin name, given, as we are told on the title page, by T. Bensley. Lewin is

generally credited with having given these names, but in future we must give credit where it is due.*

The preface, written by a brother of the author, is as follows :—

“This little Volume is the beginning of a Work which is intended to comprehend the whole of the Birds of New Holland as they may come to the Author’s hands, and which will be continued in succession, he having been nine years in that country, travelling, collecting, and painting for this purpose.

“As it is impossible at once to bring together every Species of a Genus, that may be found in a country that abounds so much in novelty, our Author intends to vary the subject in each Volume, but care will be taken, when one or more Birds of a Genus may be figured in a Volume, to give the Generic Character, or a reference to where it may have been given before, and the whole will be connected by Indices, in proper places, so as to make the Work useful, scientific, and complete. We have retrenched the descriptions of the Birds in this Work, from what was intended by the Author to be given, because we consider them dry, and unnecessary in a work where every species is beautifully and correctly figured ; and we have confined ourselves to such particulars as seem to be useful and necessary. We trust that, in thus deviating from the usual practice of Ornithologists, we shall not be condemned as having improperly lessened the expense of the Work. Sure we are that such a body of dry descriptions as usually accompanies the little quantity of useful Natural History which is generally given with each Species, is both tedious and disgusting, and so unmeaning to the general Reader as to make Ornithology appear pedantic ; whereas in our way of treating the subject, we flatter ourselves that the Ornithologists will more easily identify the Species, the general Reader will peruse the Letter-press with pleasure, and this branch of the Sciences will obtain admirers and advocates.

“THOMAS LEWIN.”

Then follows :—“A List of Subscribers/Printed by Particular Desire./ Subscribers in New South Wales./ His Excellency William Bligh,” &c., &c.

67 copies were subscribed for in New South Wales, the names of which subscribers were obtained by Lewin himself in 1806, and 6 others were obtained in London.

Lewin apparently sent over 8 more engraved plates, but these did not receive a scientific name when published in 1822, when the original 18 were again published (re-issued), after having the date rubbed off.†

The following quotation shows that Lewin was still working :—

“In April, 1815, the Governor himself, with Mrs. Macquarie,

* To credit Bensley with the authorship of the names would be erroneous. Bensley was the printer of the letter-press.—E. A. PETHERICK.

† The Latin names in the text were also omitted.—E. A. PETHERICK.

accompanied by his principal officers and Mr. Lewin, painter and Naturalist, set out on a progress to view what he called 'his latest conquest,' *i.e.*, the road across the Blue Mountains to Bathurst."

J. W. Lewin died in 1819, and was buried in New South Wales.

The plates in this work were the first natural history subjects executed in Australia.* In fact, only one set of engravings was done before—some views on copper (the copper being taken from a ship's bottom).

[Mr. E. A. Petherick, the Australian bibliographer, was present when Mr Mathews' remarks on John Lewin were read. In view of the interest attached to the paper, and that it may be historically correct, Mr. Petherick offered to correct some misstatements, hence the foot-notes, which Mr. Mathews will no doubt accept in the same kindly spirit as was offered by Mr. Petherick.—Eds.]

From Magazines, &c.

Great Brown Kingfisher Breeding in Captivity.—The Avicultural Society's medal has been awarded to Mr. Cosgrave for breeding the Laughing Jackass (*Dacelo gigas*)—*vide* *Avic. Mag.*, Ser. III., vol. iii., p. 88.

* * *

New Genus of Australian Bird.—In *The Ibis* (1912), p. 120, Mr. A. J. North, C.M.Z.S., proposes a new genus, *Trichodere*, for *Ptilotis cockerelli*. Gould pointed out that this bird "possesses characters peculiar to itself to demand a distinct generic appellation," and Mr. North adds:—"While differing in minor characters from *Glycyphila*, *Meliornis*, and *Ptilotis*, it may be readily distinguished from all these, and every other genus of the family *Meliphagidæ*, by the hair-like appearance of the sides of the feathers on the throat and fore-neck." The wonder is that so distinctive a bird was not separated generically ere this.

* * *

Hooded Parrakeets (*Psephotus cucullata*).—Members of the R.A.O.U. who attended the Sydney session last year will recollect seeing a beautiful pair of these birds alive at the Australian Museum. Concerning a pair that nested in England, Mr. H. B. Astley, writing in *The Avicultural Magazine*, February, 1912, p. 122, states:—"In November, 1911, my pair of this lovely variety of Golden-shouldered Parrakeets nested in a bird-room, the hen laying three eggs and sitting well, but the eggs did not

* Lewin previously produced a work on the insects of New South Wales (London, 1805), containing 18 plates, dated 1803 and 1804. These were the earliest engravings executed in Australia. The set of engravings on copper from a ship's bottom (by Preston) were first published in 1814.—E. A. PETHERICK.

hatch, and I removed them from the hollow log. In December she laid another clutch of three, and again incubated them steadily, in spite of which they refused to be hatched. After she had sat three weeks I examined the eggs, and found one egg clear and nearly fully-fledged young in the other two, but decomposed."

* * *

Ravenous Ravens.—Portarlington (Victoria).—Farmers in this district are suffering heavy losses through the ravages of large flocks of Crows. Owing to the dryness of the season and the hardness of the earth, the birds invaded the paddocks where green peas were being grown. After a visit by the Crows to a paddock the plants bore the appearance of having been worked by pickers, as scarcely a pod was left. When the peas became too dry the Crows migrated to the bush near Swan Bay. In that locality rabbits were being poisoned with strychnine in apples, and at day-break the Crows and Magpies, which are ravenous owing to the scarcity of their natural food, ate the dead rabbits. In this way hundreds of Crows and scores of Magpies are being destroyed daily. Such an invasion of Crows has never been known before in this district.—*Argus*, 29/1/12.

* * *

Cape Petrel.—At a meeting of the Linnean Society of New South Wales, held 29th November, 1911, Mr. Basset Hull exhibited, on behalf of Mr. L. Harrison, a skin of the Cape Petrel (*Daption capensis*), which was captured alive at Turimetta Head, Narrabeen, on the 15th October. The bird was squatting on the ledge of rock above high-water mark, and, though apparently uninjured, seemed incapable of flying. It lived in captivity for nine days, on each of which it was placed in a large bath of water for a couple of hours and fed upon morsels of fat. The fat was not taken solid, but was macerated with the aid of its bill, and the water, with its floating film of fat, greedily taken up. After feeding for about an hour the bird would spend almost another hour in bathing and preening its feathers. The bird floated high in the water, and its legs hung loosely, and were turned outward at an angle of 45° from the sagittal plane. The webbed feet were worked slowly outwards, the effect being to keep the body practically stationary.—*Proc. Linn. Soc. N.S.W.*, vol. xxxvi., p. 633.

* * *

Mongoose in Fiji.—In an article in the April (1912) issue of *The Ibis* on the avifauna of Fiji, Mr. P. H. Bahr, M.A., M.B., F.Z.S., refers to the introduction of the mongoose into the islands. The pest, he writes, was introduced about 25 years ago to keep in check the numbers of rats which were destroying sugar-cane. "The result, as elsewhere, has been that the rats are still found in plenty, whereas the more defenceless birds have suffered. To such an extent has the mongoose increased that it is now a common

and obvious feature of the landscape. The rearing of domestic fowls has become almost an impossibility. Within the confines of our garden in Suva I had little difficulty in killing over thirty of these animals in less than a fortnight by means of two mongoose traps. I frequently observed the mongoose spring on and successfully catch small birds feeding in the long grass."

Mr. C. Coles, of Sydney, writes stating that his remarks at the session of the R.A.O.U. regarding the breeding of the mongoose were not correctly reported in *The Emu*.* The statement (that the mongooses in Fiji had already mated with the rats) was made by a correspondent, and did not receive his (Mr. Coles's) endorsement. He merely mentioned it in the course of a general discussion.

* * *

Two New Species of Australian Birds.—Mr. A. J. North, C.M.Z.S., of the Australian Museum, has described in *The Ibis* (1912), p. 118, two new birds. During the preparation of an appendix to "Nests and Eggs," he discovered, in the Museum, skins of two unnamed species. The skins of both were procured by the late Mr. Alex. Morton, in February, 1879, at Port Essington, Northern Territory.

(1) *Neositta mortoni*.—"Adult male.—Like the adult male of *N. leucoptera*, but the black on the forehead extends down to the base of the bill; the mantle and back are of a darker shade of brown, and more broadly streaked with black; only the chin, throat, and centre of the forehead are white, the remainder of the under surface being brownish-white, with darker brown centres and tips to some of the feathers on the sides of the breast and abdomen."

(2) *Alcyone ramsayi*.—"Adult male.—Like adult male of *A. pusilla*, but having the upper parts and sides of the breast rich bright blue instead of ultramarine; the outer webs of the inner primaries are distinctly shaded with green; there is a larger extent of blue on the sides of the breast, and it nearly meets in the centre, while the white under tail coverts are slightly tipped with blue."

* * *

Striated Field-Wren.—Mr. H. Stuart Dove, F.Z.S., contributes to the April (1912) issue of *The Ibis* some observations on the Striated Field-Wren (*Calamanthus fuliginosus*). He states that the species is plentiful on the swampy, tussocky plains near the sea beach of the North-West Coast of Tasmania. It is a persistent songster, and there are very few months of the year when it may not be heard. It was formerly considered to be identical with the Victorian form of the same species. The song is usually uttered from the summit of a piece of scrub, or a large tussock. "The *Calamanthus*," Mr. Dove continues, "is one of our earliest breeders, beginning, probably, during the cold, frosty

* Vol. xi., p. 149.

month of July; nesting is certainly in full swing during August. . . . All the nests which I have found on this North-West Coast of Tasmania have been placed well within a large sagg or tussock. . . . The nest is usually placed a foot or two from the ground, in the heart of the tussock, with the entrance to one side among the drooping blades, by which it is completely concealed. The structure is generally placed on a base of moss and vegetable *débris*, such as fragments of dry tussock-blades. . . . Just before the middle of September I saw two young Field-Wrens making their way through a scrub of small tea-tree in charge of their parents, the example of which they followed most worthily in slipping out of sight in the quickest possible time. At the end of the same month I found three young which had lately left the nest and were concealed in some low scrub. The old birds laboured hard to draw me away from the spot, but at length I was successful in flushing the young, which lay very closely in cover."

* * *

Slaughter of Egrets.—*Bird Lore* for January–February, 1912, contains an interesting Audubon Education Leaflet on the White Egrets, written by T. Gilbert Pearson. The following "confessions" of a plume-hunter are given:—"My attention has been called to the fact that certain commercial interests in this city are circulating stories in the newspapers and elsewhere to the effect that the aigrettes used in the millinery trade come chiefly from Venezuela, where they are gathered from the ground in the large *garceros*, or breeding-colonies, of White Herons. I wish to state that I have personally engaged in the work of collecting the plumes of these birds in Venezuela. This was my business for the years 1896 to 1905, inclusive. I am thoroughly conversant with the methods employed in gathering Egret and Snowy Heron plumes in Venezuela, and I wish to give the following statement regarding the practices employed in procuring these feathers:—The birds gather in large colonies to rear their young. They have the plumes only during the mating and nesting season. After the period when they are employed in caring for their young, it is found that the plumes are virtually of no commercial value, because of the worn and frayed condition to which they have been reduced. It is the custom in Venezuela to shoot the birds while the young are in the nests. A few feathers of the large White Heron (American Egret), known as the *Garza blanca*, can be picked up of a morning about their breeding-places, but these are of small value, and are known as 'dead feathers.' They are worth locally not over \$3.00 an ounce, while the feathers taken from the bird, known as 'live feathers,' are worth \$15.00 an ounce. My work led me into every part of Venezuela and Colombia where these birds are to be found, and I have never yet found or heard tell of any *garceros* that were guarded for the purpose of simply gathering the feathers from the ground. No

such a condition exists in Venezuela. The story is absolutely without foundation, in my opinion, and has simply been put forward for commercial purposes. The natives of the country, who do virtually all of the hunting for feathers, are not provident in their nature, and their practices are of a most cruel and brutal nature. I have seen them frequently pull the plumes from wounded birds, leaving the crippled birds to die of starvation, unable to respond to the cries of their young in the nests above, which were calling for food. I have known these people to tie and prop up wounded Egrets on the marsh, where they would attract the attention of other birds flying by. These decoys they keep in this position until they die of their wounds or from the attacks of insects. I have seen the terrible red ants of that country actually eating out the eyes of these wounded, helpless birds that were tied up by the plume-hunters. I could write you many pages of the horrors practised in gathering aigrette feathers in Venezuela by the natives for the millinery trade of Paris and New York."

Reviews.

["The Flight of Birds." By F. W. Headley, M.B.O.U. Witherby and Co., London. Price, 5s. net.]

WORKS on aerial navigation and the flight of birds are usually too technical to appeal to the average reader, but Mr. Headley, in this compact little volume, has endeavoured to avoid the use of technical terms, and as a result his views are intelligible to those who are not mathematicians. The author dealt at length with the subject of bird flight in his valuable "Structure and Life of Birds" and the more popular book entitled "Life and Evolution." Necessarily he covers, in his latest volume, much the same ground, and several of the illustrations in "Life and Evolution" are reproduced; but every page of "The Flight of Birds" is worthy of careful perusal by those ornithologists whose interests are not confined to the mere collecting of specimens and field observations. The chapters deal at length with such subjects as gliding, stability, motive power, steering, pace, and last, the machinery of flight, and so forth. It is impossible to even outline the author's views in the limits of a review, but the following extract from the chapter on stability is of special interest:—"What we see in the flight of birds—I am not now speaking of soaring—is not a steady, careful maintenance of equilibrium, but an instantaneous recovery of balance whenever it is lost. The bird can afford to be indifferent to the difficult problems which this subject presents. . . . However the gusts and vagaries of the wind may upset him, he can right himself at once. He owes his wonderful stability to some extent to his fine build and the elasticity of his feathers, but mainly to manœuvres and adjustments that cannot be mere reflexes. The flying machine which

he pilots is admirably built; still, it can never dispense with a pilot. But his voluntary adjustments are largely instinctive, and even the niceties of adjustment that he has to learn must become through habit almost automatic." The volume is furnished with 16 plates and many text figures, which are very helpful to the reader.

["The Migration of Birds." By T. A. Coward, Cambridge. The University Press: 1912.]

THE migration of birds is ever a fascinating subject, and seemingly mysterious, because little is understood regarding it.

Mr. Coward's small but well-written *brochure* is welcome because he has brought together some of the more important theories and given prominence to ascertained facts. He deals with "The Cause and Origin of Migration," "Routes," "Height and Speed of Migration Flight," "Orientation and Route-Finding," "Distance Travelled by Birds," &c., in a very lucid manner. Regarding the direction and distance travelled, the author agrees with Mr. Wells Cooke that no invariable rule, law, or custom apparently exists, and that each species presents a separate problem, "to be solved, for the most part, only by patient, painstaking observations and by the recognition of sub-species."

The distances covered during migration by the Golden Plovers are amazing. The American Golden Plover (*Charadrius dominicus*) nests along the Arctic coasts of North America, from Alaska to Hudson Bay. As soon as the young are able to take care of themselves the birds migrate south-east to Labrador, where they fatten for some weeks on the harvest of autumn fruits. A short journey across the Gulf of St. Lawrence brings them to Nova Scotia. Then a start is made for South America, some birds reaching the Argentina, and, it is suspected, even Patagonia. Strange to state, the return journey is more to the westward, across Bolivia, towards Central America. From Yucatan the birds cross the Gulf of Mexico, then travel up the Mississippi valley, and across Canada to their northern breeding-grounds. Thus, the round trip forms an enormous ellipse, having a minor axis of 2,000 miles and a major axis stretching 8,000 miles—from Arctic America to the Argentina. During this great migration feat it is thought that the Plovers, under favourable conditions, attain the incredible speed of from 150 to 200 miles an hour. Coming near home, the Eastern or Pacific Golden Plover (*C. fulvus*) is equally interesting. This bird breeds on the northern shores of eastern Siberia and on the Alaskan side of Behring Strait. It winters on the mainland of south-eastern Asia and throughout Oceania, including Australia and New Zealand. The flight of the Alaska birds to the Hawaiian Islands is supposed to be one effort of 2,400 miles.

This fascinating and instructive little book may be purchased for 1s. net in cloth or 2s. 6d. net in lambskin.

Bird Observers' Club.

THE monthly meeting of the Bird Observers' Club was held at the Mia-Mia Tea Rooms, Collins-street, Melbourne, on Wednesday evening, 21st February, 1912. Mr. J. A. Leach was the host for the evening. Dr. H. W. Bryant, the president, occupied the chair. Mr. L. G. Chandler, hon. sec., stated that the sub-committee appointed to deal with the question of game bags had fixed the limit to be proposed at 20 and 15 brace respectively for Quail and Duck. Mr. T. H. Tregellas read extracts from a letter which he had recently received from a friend living near Kerang. It was stated that several "big guns" were in use in the swamps around Kerang. In March, 1911, Cygnets were ruthlessly shot on the lagoons by visiting sportsmen. The hon. secretary read a report of the interview with Mr. Graham (Minister for Agriculture) on the subject of the close season for Quail. Mr. J. A. Leach, M.Sc., stated that he had since conferred with Dr. Cameron and Major Semmens. Dr. Cameron was much impressed with the views put forward by the deputation. Mr. C. Cole said that at Heidelberg on the opening day of the season there appeared to be a number of young and half-grown birds about. Mr. J. A. Leach referred to the great success of the Gould League of Bird Lovers. He praised Messrs. H. W. Wilson and C. Fenner for their excellent work in connection with the League. Mr. D. Le Souëf, C.M.Z.S., moved that a sub-committee consisting of Messrs. J. A. Leach, H. W. Wilson, F. E. Wilson, C. Fenner, Charles Barrett, and L. G. Chandler, be formed to conduct the business of the League. The motion was seconded by Mr. A. H. E. Mattingley, C.M.Z.S., and carried. It was unanimously decided that the money be placed in a trust account, to be called the B.O.C. Gould League Trust Account. Mr. C. Barrett then read the report of the sub-committee appointed to deal with the Gould League essays. The report was adopted. Mr. D. Le Souëf read the report of the sub-committee which was appointed to suggest a means whereby the Mutton-Birds on Phillip Island might be preserved. After some discussion, Mr. A. J. Campbell moved that the following suggestions be added to the list of recommendations:—“(1) That there should be a fee per head for campers, or toll on every dozen eggs; (2) that no burrows should be opened by hand or by the aid of any implement whatever.” The motion was seconded by Mr. F. E. Wilson, and carried. On the motion of Mr. Leach, seconded by Mr. H. W. Wilson, the report was adopted.

The March meeting of the Bird Observers' Club was held at the residence of Mr. D. Le Souëf, C.M.Z.S., Zoological Gardens, Parkville, on Thursday evening, 21st March, 1912. Dr. C. Ryan and Mr. Le Souëf were joint hosts. Before dinner a tour was made of the gardens. A fine specimen of the White-plumed Egret (*Herodias timoriensis*), domiciled in the large flight aviary, was greatly admired. Mr. Le Souëf stated that when the Duck season opened a number of birds made the gardens a sanctuary. At 8 p.m. Dr. Ryan was voted to the chair. Mr. C. Fenner was unanimously elected a member of the Club. Mr. A. H. E. Mattingley proposed that Mr. H. W. Wilson be made a life member of the Club, in appreciation of his past services. The motion, which was seconded by Mr. E. Brooke Nicholls, was carried unanimously. Messrs. C. Barrett and E. Brooke Nicholls were re-elected as the B.O.C. representatives on the committee of the National Parks Association. Mr. Le Souëf read a paper on the Mutton-Birds' rookeries at Phillip Island and elsewhere. At one rookery on Phillip Island he saw sixteen birds which had been cut open. Mr. A. H. E. Mattingley said he thought that it would be a good idea to put rings on the legs of a number of Mutton-Birds. An offer of rings made by Mr. Dyer was accepted with thanks. Dr. Chas. Ryan offered to give £1 towards the expense of buying rings. It was finally decided to make a trip to Phillip Island. Mr. Mattingley read a paper entitled "Birds

in Ancient Medicine." Mr. C. Cole mentioned that he had seen the Flame-breasted Robin (*Petrarca phoenicea*) at Hawthorn (Vic.) on 20th March. Mr. J. Ross stated that a fisherman friend of his had seen, on 20th March, a pair of Flame-breasted Robins pass over the boat, near Queenscliff (Vic.) The birds were flying north, and were about 8 miles from land.

The monthly meeting of the Bird Observers' Club was held at the residence of Dr. H. W. Bryant, "Tarella," Toorak, on Wednesday evening, 17th April. The host occupied the chair. The chairman read a letter received from Mr. O. W. Rosenbain, dated from Egypt. Mr. Rosenbain described several species of birds which he had met with in the valley of the Nile. He also forwarded two specimens of Quail shot in that country. Mr. Laidlaw was unanimously elected a member of the Club. Mr. L. G. Chandler read a brief paper on the Mistletoe-Bird (*Dicaeum hirundinaceum*), and a discussion arose regarding the habits of the species. Mr. T. H. Tregellas exhibited three specimens of the Mistletoe-Bird. Mr. Chas. Barrett showed a photograph of an Emu, taken at Wilson's Promontory. Mr. F. E. Wilson exhibited nest of the Mistletoe-Bird, and Mr. L. G. Chandler photographs of young Mistletoe-Birds and nest.

FIELD OUTING : RINGING MUTTON-BIRDS.

Several members of the B.O.C. spent a very profitable and enjoyable week-end on Phillip Island from the 20th April to 22nd April, 1912.

The party drove from Cowes to the rookery at "The Narrows." Much useful information was elicited from our driver concerning the habits of the Mutton-Bird (*Puffinus brevicaudus*). One interesting statement was that the young birds do not go straight out to sea on their first flight, but make several short journeys, and return to their burrows for a day or two before finally leaving the locality.

At "The Narrows" the members of the party got to work with wire crooks, but it was difficult to draw the nestlings from the burrows, and only 13 birds were ringed. The rings were numbered and dated, and had the inscription "B.O.C., Melbourne," stamped upon them. A wooden stake was driven into the ground at the entrance to each burrow containing a ringed bird, and a brass tag, dated and numbered to correspond with the ring, was affixed to it. By this means the Club hopes to determine next season whether the birds return to their birthplace to nest. Three young Mutton-Birds were caught in the surf; they had probably been driven in by the heavy wind which prevailed on the previous night. Rings were placed on their legs, and they were then liberated. As it was the first visit to Phillip Island of several members of the party a visit was made to Cape Wollomai. Birding had evidently been going on, as a number of heads of young Mutton-Birds were noted. A certain amount of cruelty is involved in drawing a young bird from its burrow. An egg-crook is used, with the wire cut so as to form two prongs at the end; this is worked behind the bird, which is dragged out with the spikes digging into its body. The remains of several old birds were found entangled in the barbed-wire fences at Wollomai. This wire probably causes the death of a large number of birds. It was noticed, too, that cattle had broken through the soil into many of the burrows. At Wollomai the party met Inspector Rowson, of the Fisheries and Game Department.

The party returned to "The Narrows," and, after tea, sat down and waited for the young birds to leave their burrows. The first bird appeared at about 7 p.m.; it was captured and a ring placed on its leg. Altogether 42 birds were ringed during the trip. Of course, the burrows could not be marked in the evening. The first bird caught in the evening was one of the ringed ones that had been taken from the surf earlier in the day. The old birds had evidently deserted their nestlings, as none was seen.

It is hoped that if any of the ringed birds are picked up dead in any part of the world information will be forwarded to Mr. L. G. Chandler, the hon. secretary of the B.O.C., 56 Dixon-street, Malvern, Victoria.

South Australian Ornithological Association.

A MEETING of the South Australian Ornithological Association was held on the evening of 23rd February, Mr. M. Symonds Clark presiding. Mr. J. W. Mellor reported having noted the Ground-Thrush (*Oreocichia lunulata*) at the Reedbeds lately, where it had not previously been seen. He thought perhaps the fires in the Mount Lofty Ranges had something to do with its appearance on the plains. Mr. F. R. Zietz showed a collection of Finches, the property of the Museum, 19 species in all. Mr. J. W. Mellor gave an account of the re-discovery of the Spotted-throated Scrub-Wren (*Sericornis ocellans*) in the Mount Lofty Ranges in September last. He also gave an account of his securing a specimen of the Darker Turquoise Wren (*Malurus whitei*), which had not been shown since it was named by Mr. A. J. Campbell, of Melbourne, after the late Mr. Samuel White, of the Reedbeds (S.A.)

The thirteenth annual meeting of the Association was held at the Institute, North-terrace, on the evening of 29th March, Captain S. A. White presiding. There was a good attendance. The honorary secretary (Mr. J. W. Mellor), in his annual report, stated that exceptionally good work had been carried out by the Association during the past year, notably the lease to the Association of the islands in the Coorong for the purpose of protecting the native birds and allowing them to breed there. For the purpose of preventing them being molested by so called sportsmen and other visitors, a custodian had been appointed, who knew the locality thoroughly. Another notable work had been the placing of Mallee-Fowl (*Lipoa ocellata*) on the National Reserve at Cape Borda, Kangaroo Island, where they were free from the ravages of the fox, which was fast exterminating these remarkable birds on the mainland. It was hoped that the residents of the island would all act as special custodians to see that the birds were rigidly protected wherever they might roam, as in years to come, when the birds were extinct on the mainland, the island would be a novelty to the world, and a place of exceptional interest to visitors. New members had joined the Association, and the general interest now displayed in the study and protection of native birds was on the increase. Amounts in connection with the Mallee-Fowl fund, to place them on Kangaroo Island, had come in satisfactorily, and donations were still welcomed. The honorary secretary read a letter from Mr. A. H. Anderson, of Kingscote, Kangaroo Island, urging the protection of the much-abused Cormorant, and giving interesting details relative to his observations upon the habits of these birds, whose chief food consisted of many of the enemies of the fishes' spawn. It was resolved to move in the matter, and the honorary secretary was deputed to interview the authorities. The sudden death of Dr. W. T. Angove, of Tea-tree Gully, which occurred in London, was referred to, and it was decided to write a letter of condolence to his widow and family, and also place on record his good work done during his connection with the Association. Mr. F. E. Parsons, of Adelaide, was elected a member. Mr. J. W. Mellor tabled a specimen copy of a work entitled "The Game-Birds and Water-Fowl of South Africa," now being written by Major B. Horsburgh. The work was favourably commented upon by those present, the coloured plates being excellent. Captain S. A. White drew attention to the first issue of a new periodical being published in England upon Australian bird-life, and edited by Mr. G. M. Mathews, F.R.S.E., ornithologist, and entitled *The Austral Avian Record*. Captain White also showed several birds secured near Meningie,

Lake Albert, notably a pied Raven, which was deemed to be a "sport" of the common kind (*Corone australis*), the Elegant Grass-Parrot (*Neophema elegans*), the Black-throated Grebe (*Podiceps poliocephalus*), the Hoary-headed Grebe (*P. nova-hollandiae*), and several small Water-Crakes. Mr. E. Ashby made some interesting and instructive remarks upon the Northern Territory birds, a number of which he displayed to illustrate the various species, notably the Pigmy Goose (*Nettion albigularis*), Boat-billed Flycatcher (*Myiagra latirostris*), Yellow White-eye (*Zosterops lutea*), White-breasted Honey-eater (*Glycyphila fasciata*), Varied Lorikeet (*Ptilosclera versicolor*), Great Bower-bird (*Chlamydodera nuchalis*), and others. A vote of thanks was accorded Mr. Ashby for his remarks and exhibition of specimens. The following members were elected as officers for the ensuing year:—President, Mr. E. Ashby; vice-president, Mr. F. R. Zietz; hon. secretary, Mr. J. W. Mellor; these to form the general committee of management.

The monthly meeting of the Association was held on the evening of 26th April, at the Royal Society's rooms, North-terrace. Mr. E. Ashby presided. The secretary read a letter from Mr. Crawford Vaughan, in which that gentleman stated his pleasure in being able to assist in the protection of the native fauna and flora. A letter was received from Mr. Anderson, of Kingscote, concerning the birds nesting on the Spit. The secretary stated that action was being taken in the matter. Mr. J. W. Mellor described his recent trip to Yorke Peninsula, and exhibited a specimen of the Greenshank (*Glottis nebularius*) and Grey Plover (*Squatarola helvetica*), the latter a rare bird; also the Curlew-Sandpiper (*Ancylochilus subarquatus*), in breeding plumage, a novel occurrence. Captain S. A. White, by the aid of a sketch map, gave an interesting description of his two ornithological trips to Kangaroo Island, which he made in the interests of Mr. Mathews' work. He described the birds, animals, and flora met with there. He made a strong appeal for the protection of the native fauna and flora of the island, which are being rapidly wiped out. In conjunction with the description some birds' skins were exhibited. Among them were the Kangaroo Island Scrub-Wren (*Sericornis halmaturina*), lately named by Mr. A. J. Campbell, of Melbourne; the Scarlet-breasted Robin (*Petroica legerii*), which seems very much smaller than the mainland variety; and the Blue Wren (*Malurus cyaneus*), which is undoubtedly larger than the mainland bird. Captain White showed a Sparrow-Hawk (*Accipiter*) from Kangaroo Island, which differs in size and colouration from any found on the mainland.

Notes and Notices.

Corrections.—*Emu*, vol. xi., page 247, 12th line from bottom, "44 mm." should read "14 mm."; and on page 249—nest of *Pseudogerygone jacksoni*—"1 inch in circumference" should read "1 inch in diameter."

Useful Members.—Mr. Edwin Ashby, Adelaide, has been elected president of the South Australian Ornithological Association, and Mr. J. A. Leach, M.Sc., Melbourne, has been elected president of the Field Naturalists' Club of Victoria.

Treasurer's Note.—The hon. treasurer R.A.O.U. announces that he will be glad to receive subscriptions for the current year, and desires to remind members that it is as necessary for him to find payment for the first part of *The Emu*, when published, as it is for the fourth part.

New Zealand Bronze-Cuckoo.—The fact that the expedition of the R.A.O.U. found *Chrysococcyx lucidus* on the Capricorn Group in 1910 (8th to 18th October) is of considerable interest. We in New Zealand had an idea that the bird reached the northern part of the Dominion at the end of September. Thus the bird does not come more or less about a fixed date, but must either straggle to us or be a resident of the Capricorns. Another interesting point would be to know if, on their return, it is all mature birds that arrive first, and when the young of the year arrive. The adults leave us towards the beginning of February, but I have seen the young well into March.—J. C. M'LEAN. Hawke's Bay, N.Z., 7/3/12.

Introduced Owls.—Under *Ninox novæ-zealandiæ* ("Bush Birds of New Zealand," *Emu*, vol. xi., p. 14) it was meant to imply, in the last paragraph, that the Little Owls might, by naturally frequenting the forests in the breeding season, affect our bush-birds. Just lately I came across this paragraph in *The Dominion* (13/2/12):—"It is worthy of note, since Little Owls have been imported in great numbers from France into New Zealand, in the hope that they will make short work of Sparrows, that they have the reputation also of killing all birds that they meet, and it has just been decided that the Little Owl is to be no longer protected in Huntingdonshire, where it has come to be considered, by reason of its rapid production, a scourge." It is written by one of their English correspondents, and may be very pleasant reading for a few, but will cause some uneasiness of mind to those who have no sympathy with hasty acclimatization and have at heart the welfare and protection of our native birds.—J. C. M'LEAN. Hawke's Bay, N.Z., 7/3/12.

The Late Dr. Angove.—Members of the R.A.O.U. will be extremely sorry to hear of the demise of Dr. W. T. Angove, M.R.C.S., L.S.A. London, of Tea-tree Gully, South Australia, which occurred on the 15th of March last at Guy's Hospital, London. Dr. Angove was a keen ornithologist and oologist, and was a member of the South Australian Ornithological Association almost from its inception. He took a lively interest in the welfare of the Association, and was looked up to by its members as a sound ornithologist. Members of the R.A.O.U. who attended the last session in Adelaide and the camp-out on Eyre Peninsula will remember how agreeable and light-hearted the Doctor was, and how earnestly he took part in all the excursions in connection with the camp-out. Perhaps some who were round the camp-fire the last evening at "Warunda Camp" will recall how Dr. Angove said he would like to see his birthplace and old home before he died. His wish was literally fulfilled. His eldest daughter, who is a nurse in Guy's Hospital, was with her father at the last. Dr. Angove leaves a widow and sons in South Australia to mourn their loss, and with whom the members of the R.A.O.U. desire to sympathize.

Next Bird Day.—Bird Day will be celebrated this year on Friday, 13th October, in Victorian schools. The New South Wales Gould League of Bird Lovers has already announced 11th October as the date of Bird Day in that State. The South Australian Gould League is again celebrating Bird and Tree Day in all schools. Bird lovers will visit schools in Victoria on Bird Day to address the senior pupils or lead excursions.

The October number of *The School Paper* will be a bird number. Members of the R.A.O.U. are kindly invited to send articles (illustrated, if possible) of about 500 words to the Editor, *School Paper*, Education Department, Melbourne, not later than 20th July.

The Old Order and the New.—The following extracts (which represent the view of many field ornithologists) are taken from a letter recently written to a member of Council of the R.A.O.U. : —“ I have just received the first two parts of *The Austral Avian Record*, by Gregory M. Mathews. I know the author well—have stayed at his house. I consider the law of priority is being carried to extremes. For example, *Glycyphila fulvifrons* is changed to *G. melanops*—the latter designation being a wrong description of the bird, &c. Also, the splitting of sub-species appears to be overdone. So many trinomials will, I think, cause many who have taken up ornithology as a hobby and recreation to give it up, as the tax on one's memory will be really too great, and pleasure will be turned into toil. Also, where is the collecting of specimens of both birds and eggs to cease? Some enthusiasts will want specimens of both from all localities. Apparently the editors of *The Ibis* (1912, page 353) consider the thing is being overdone in the case of European birds. Great confusion is already being caused. . . . I think it is time that a stand was taken against the most confusing alterations and additions that are being made in the nomenclature of Australian birds (see *Austral Avian Record*, No. 1, p. 12; *Bulletin B.O.C.*, clxxvi., p. 70, &c.) Sooner than adopt trinomials generally I will use the original vernacular names, or drop ornithology altogether as far as writing upon the subject is concerned. Why should the nomenclature of Australian birds be altered at the will of self-elected arbitrators? If the majority of working naturalists do not agree with their views, why should these views be accepted? How we miss poor Bowdler Sharpe!”

Exploring Members.—Captain Barclay's exploring expedition to the Northern Territory, with Mr. G. F. Hill, R.A.O.U., as naturalist, safely reached Borraloola, Gulf of Carpentaria, on 8th September last, having travelled from Oodnadatta in a zig-zag course on camels. When loading one of the camels for the last day's journey Mr. Hill had the misfortune to rupture himself, but was able to continue his work with Captain Barclay in the neighbourhood of Macarthur River. About the middle of March,

the majority of the party having gone southward to explore the country between the Queensland border and the telegraph line, Captain Barclay and Mr. Hill proceeded on horseback to the Katherine, and arrived there on 13th April, thence to Pine Creek, and finally to Darwin by rail, which place was reached 17th April. While at Darwin Captain Barclay received instructions to carry out extensive exploration work at the Gulf of Carpentaria and on adjacent islands, Mr. Hill being appointed naturalist to the expedition. However, Mr. Hill's rupture now began to cause trouble, and he had to proceed to the Naval Hospital, Hong Kong, and submit to operative treatment. Members will be extremely glad to learn that his father, Mr. G. R. Hill, Melbourne, has received a cablegram announcing that his son had left the hospital, and in due course hoped to return to Darwin, then on to the Gulf region to rejoin Captain Barclay.

Mr. C. Price Conigrave, F.R.G.S., &c., formerly of the Perth (W.A.) Museum, after his adventurous exploring work in the far North-West (see *Emu*, vol. xi., pp. 267-269), has decided to settle in Melbourne. He commenced a short series of lectures in that city on 29th June, when the veteran explorer, the Right Hon. Sir John Forrest, G.C.M.G., occupied the chair. The opening night was specially under the auspices of the Union, the Bird Observers' Club, and other kindred societies. Mr. Conigrave recounted in admirable fashion how he and his comrades (Messrs. L. Burns and Roy Collison) gave up the comforts of life for a season to endure hardships—not to mention imminently risking their lives—in the sacred cause of scientific knowledge. The lecture was abundantly illustrated with a series of splendid photographs, not only taken but developed *en route*. Not of the least importance to the R.A.O.U. is the fact that the whole of Mr. Conigrave's field-notes on birds will appear in *The Emu*. This is by arrangement with Mr. Gregory Mathews, who has been extremely fortunate in procuring the bird collection—some 400 specimens.

New Zealand Albinos.—A large number of albino forms, more or less complete, have been recorded of New Zealand birds. I now add two other records of birds in Mr. O'Connor's private collection, one recently obtained in the neighbourhood of Wellington, and the other from the Nelson district, in the South Island.

I also desire to record that in December last a very beautiful specimen of an almost pure albino of *Eudynamis taitensis* was brought into town. The whole bird was of a snowy whiteness, with the exception of a slight indication of the brown bars under the tail. The legs were a beautiful lemon-yellow, and the tail was of an ivory whiteness, showing a little yellow at the base. I did not see the eye soon enough to note the colour, but, as stuffed, the iris is given as a pale grey colour.

Mr. O'Connor's specimens are a partial albino South Island

Tit (*Petræca macrocephala*) from Nelson, and a partial albino North Island or Pied Tit (*Petræca toitoi*) from Wellington.

Petræca macrocephala.—In a normal specimen the male has the head, neck all round, and all the upper parts black, with a white frontal spot, with the under surface a pale lemon-yellow. In this specimen the white frontal spot may be traced, but the whole of the head to the vertex is white, with a suffusion of yellowish ochre, most pronounced near the frontal spot, and diminishing in intensity to the vertex; intermingled are a few black feathers. The black feathers from the neck, to the base of the tail are tipped for about a quarter of an inch with white, shading off into grey. The rectal bristles white. A line of black feathers over the eyes, and beneath each eye a patch of scattered white feathers. Beneath the mandibles, the neck, and the breast is black, with the edge sharply marked; the under parts are white, strongly tinged with ochre, darkest near the upper margin.

The other specimen is a male of *Petræca toitoi*; Upper Hutt, 16/7/11. Here the albinism is more complete, the head, breast, abdomen, and back being pure white, more or less interspersed with black feathers, with a black patch at the back of the neck. The right wing has the third and fourth primaries pure white. The outer tail feather on the left side is pure white, and the other tail feathers have a larger proportion of white than usual. The feet and tarsi are normal. The late Sir Walter Buller, in his supplementary work on the "Birds of New Zealand," records a somewhat similar specimen from Otaki (p. 14, vol. ii.), and points out that there is a fine albino in the Wanganui Museum without a single dark feather.

Strangely enough, I have just received a very rare priced catalogue of a sale of the birds which formed part of the great collection of curiosities of all kinds in the London Museum of Natural History, better known by the name of Bullock's Museum, at the Egyptian Hall, Piccadilly. The collection was a very large one for those days, and was offered to the British Government previous to the sale for £50,000.

On the fourth day of the sale—2nd May, 1819—lot 52 was "a nondescript Cuckoo, perfectly white, less than half the size of the common, taken in Cornwall and sent to Sir Joseph Banks; the only one known." The specimen fetched £3 3s., but the name of the purchaser is not recorded. Lot 43 was a very fine specimen of "the Great Auk—a male—the only one taken on the British coast for many years; and an egg, in glass case." The lucky purchaser secured the lot for £16 5s. 6d. Lot 58 was "an undescribed Ibis" from New Zealand—the only one known. The highest price was given for lot 83—"a red-breasted Goose (*Anas ruficollis*), male, shot near Berwick, the only one recorded to have been killed in England for upwards of 40 years." This fetched £27.—A. HAMILTON, Dominion Museum, Wellington (N.Z.)

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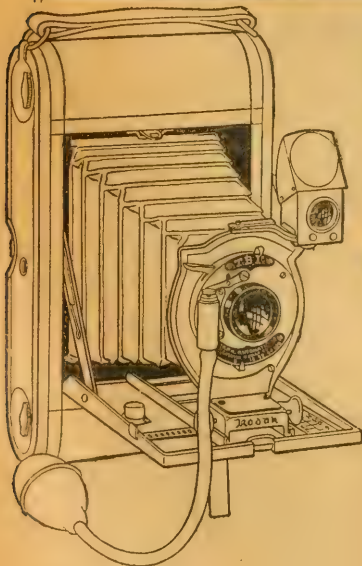
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Haunt of the Spotted Bower-Bird (*Chlamydodera maculata*).

FROM A PHOTO. BY S. W. JACKSON.

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"Birds of a feather."

VOL. XII.]

1ST OCTOBER, 1912.

[PART 2.

Haunts of the Spotted Bower-Bird (*Chlamydodera maculata*, Gld.)

BY SIDNEY WM. JACKSON, R.A.O.U., CHATSWOOD, NEW SOUTH WALES.

THE ornithological research trip, of which the following pages furnish a record, was undertaken on behalf of Mr. Henry L. White, of Belltrees, Scone, New South Wales, and had for its object the collecting of the nests and eggs of the Spotted Bower-Bird (*Chlamydodera maculata*) and of other species, and the study in general of the habits and nidification of the birds. I left Sydney on the 14th September, 1911, taking train to Collarenebri, from which point a further drive of 50 miles over very dry country brought me to Cambo Cambo station, where my camp was pitched shortly afterwards. This station lies on the west bank of the Moonie River, in New South Wales, but within a few miles of the Queensland border fence; my camp, therefore, was located about 500 miles north-west of Sydney. Cambo Cambo is the property of Mr. J. H. Doyle, who had very kindly given Mr. White permission for me to camp and carry on my work on his property. His kindness, however, did not stop at giving permission, as both from himself and from Mr. Bruce Doyle and Mr. Melville Doyle every kindness and help was rendered.

The camp was situated about 3 miles from the station homestead, and, unfortunately, the locality was in the grip of an unusually dry and hot season—in fact, several of the old residents stated that it was the most severe season experienced there for a number of years; consequently, my prospects for success could hardly be regarded as encouraging. Grass and water were scarce, the graziers in the locality were more or less suffering loss, and things were, in general, getting into a deplorable state. The local station managers informed me that in a good season the whole face of the country was transformed—everything green and beautiful, and the grass waving knee-deep for miles upon miles, like one inexhaustible wheat-field. Water, too, under these conditions was more plentiful, and, as would be only natural during a good season, there would be a much better supply of food for the different birds, especially the Spotted Bower-Birds, which mostly live on the various berries and other native fruits, though

they never fail to frequent the orchard of the run-holder when the fruit is ripe; "out back," however, such places are few and far apart. To give some idea (by contrast) of the different conditions of an ordinarily good season, I may mention that, after I had finished my work, broken camp, and returned to Sydney, the drought broke in June, 1912, and in the locality which I had only known as sun-dried and drought-smitten over 6 inches of rainfall were registered by Mr. Melville Doyle at the Cambo Cambo homestead; and in a recent letter he informed me that all the tanks and dams were full, and the Moonie River running strongly, after the long dry spell which had prevailed during my stay.

As the field study of botany and ornithology are interdependent, I take this early stage of thanking Mr. J. H. Maiden, F.L.S., Director of the Botanic Gardens, Sydney, for his kindness in naming the botanical material collected during the trip.

DIARY OF FIELD OBSERVATIONS.

19th September.—After spending a few days going over the station and tentatively studying the Spotted Bower-Birds, a central spot was selected for the camp, and, after my goods were carted out, the tent was put up under the shade of a green wilga (*Geijera parviflora*, Lindl.) tree. This tree stood close to a sheep-tank or dam, and it was not long before the curious Spotted Bower-Birds found me, and, later on, every morning their peculiar noises and wonderful rehearsals of mimicry would awaken me at daylight. On the west side of this sheep-tank, and almost within a stone's-throw from my camp, these birds were playing in a new, well constructed and decorated bower which they had built on a piece of hard, bare ground under the shade of a wilga, on the site of a ringbarkers' old camp. Messrs. Bruce Doyle, Melville Doyle, and W. L. Trewenack were with me to-day when this bower (No. 1) was first discovered, and we all examined the curious display of decorations in it. They had kindly accompanied me out to this part of the station with the view to assisting me to pick a suitable place to put up my camp, near a dam of good water. The bower (Plate VII.) had actually been built at a place where we had at first decided to camp, and was placed facing north and south. The decorations included many articles which the birds had evidently picked up on far-off station homesteads and from various bush camps, or where such once stood. Among several articles which were missed from my camp during this trip were an aluminium teaspoon, together with a small pair of silver-plated entomological forceps, and on my visiting this bower (No. 1) I found them there. On this day the decorations in it were as follow:—Numerous bleached and burnt rib and vertebra bones of sheep, Emus' toe-bones, many pieces of glass of various colours, a number of glass stoppers from sauce bottles, thin galvanized iron clippings, galvanized roofing screws and washers, small pieces of bright tin, tea lead; various berries and seed-pods, including those of the needle-wood tree (*Hakea leucoptera*, R. Br.), and old ones of the leopard-wood tree (*Flindersia maculosa*, F. v. M.); three necks of bottles, small stones, pieces of bleached Emu egg-shell, one cartridge case, lead capsules from pickle bottles, &c., old nails, buttons, and large green cigar-shaped pods of the native silk-vine (*Marsdenia leichhardtiana*, F. v. M.), &c. The foundation of the bower was constructed of thin sticks and twigs cleverly worked together, forming a firm platform, and the sides or walls consisted of a perpendicular erection of a few thin sticks and a great quantity of long, clean, and dead stems of a local grass generally known as blue-grass (*Andropogon sericeus*, R. Br.)



Play-ground of Spotted Bower-Bird (*Chlamydodera maculata*) under Wilga tree.

The walls of this bower were nearly 15 inches high. At the time only two birds appeared to frequent it.

20th September.—The Spotted Bower-Birds were about the camp at daylight this morning, and appeared very tame. When away from their play-ground and my camp, and in the bush, these birds appeared extremely shy, and it was really most difficult to get near them; but in contrast to this they would calmly and fearlessly hop and feed about within 5 or 6 feet of me as I sat at the front of my tent writing my notes or having my meals. They also become tame about a bush homestead, and even enter the kitchens; yet out in the bush they are just the reverse—shy and wary.

21st September.—Two Spotted Bower-Birds at camp again this morning at daylight. Sometimes they had a peculiar habit of stretching their necks when they looked down from a tree near the bower or my camp, and thus assumed quite a stiff and rather lengthened appearance. The flight of these birds, though fairly rapid, appears at times somewhat flappy and laboured, the wings every now and then being closed against the body. The flight usually consists of a succession of long wavelike swoops, and it is when the bird rises to these that the wings close, and the few flaps take place on the fall after each rise. When on the wing the birds generally travel in a very straight line, and seldom divert to the left or right, but keep straight ahead for the spot for which they are making. They are very difficult birds to follow (especially where timber is thick) owing to their direct flight, and they are often soon lost to view. They are not high fliers, and frequently keep just a little above the tree-tops. When the birds were down drinking at the sheep-tank at the camp or the Moonie River, repeated attempts were made to follow them immediately they left, and this was done with the view and hope of thus being led to the nest, if such existed. These efforts, however, were fruitless, and in each case the bird was soon lost, as its quick, straight flight and dull-coloured plumage all contributed to its swift vanishing over trees or in the mirage dancing on the distant plain. When anyone is about the Spotted Bower-Bird has a decided liking to fly up into a dead and absolutely leafless tree; probably this is because a clear view of the surroundings can be obtained from such a position better than would be the case from a green or well-foliaged tree. When it came to nest-building, however, the birds always were found to choose a green tree, so I recorded the conclusion that it was a case of dead and leafless trees for "look-out," and green trees for nest-building. When flying from their play-grounds, a branch of a dead tree was usually selected to perch upon—very seldom did they fly from the play-ground direct to a green tree; that, however, it must be understood, is apart from the green tree or bush under which the bower may have been built, as they often hop up from the bower and into this tree before they make their flight. Careful observations led me to note, in all the cases that came under my notice during the whole trip, they have one particular branch of a dead tree upon which they fly when leaving the bower. Strange to say, the birds were seldom seen out in the bush, and it behoved me to follow them every chance I got. The proper or regular note of these birds is a harsh guttural sound, closely resembling that produced by the Satin Bower-Bird (*Ptilonorhynchus violaceus*), the Regent Bower-Bird (*Sericulus chrysocephalus*), and others of the family.

The Spotted Bower-Birds frequently uttered a deep frog-like croak while feeding about and chasing one another in front of my camp, and when thus engaged they have a queer habit of hopping sideways rather than straight ahead. The two Bower-Birds which were constantly near my camp usually flew straight from my tent over to their play-ground, and sometimes they would flap away heavily loaded with a large lump of dry damper crust, or else fly off quietly with some light article filched for the purpose of decorating the play-ground. Anything bright had to be kept in a box away

from the eyes of these birds. It is wonderful to note the way in which they can swallow or gulp large pieces of hard, sun-dried damper crust—one would think it enough to choke them. Empty jam-tins were at all times picked clean, and little or nothing left for the myriads of pestering black ants (*Iridomyrmex rufoniger*).

22nd September.—Sometimes during a whole day's tramp of many miles through the bush and across the plains, not a single Bower-Bird would be noticed; this, of course, as I came to recognize later on, was due to the fact that they were then not very abundant. Saw another new play-ground to-day, which was placed under the shade of a boobialla tree (*Myoporum acuminatum*, R. Br.), nearly 3 miles northwards from camp; only one bird was noticed leaving it. This is bower No. 2. In construction it was similar to that of No. 1; the walls of the passage being formed of long dead stems of the local blue-grass (*Andropogon sericeus*, R. Br.) The decorations included the following articles:—Small bleached bones of sheep and Emus, various native seeds and berries, glass, two glass stoppers from sauce bottles, thin clippings of galvanized iron, stones, two brass cartridge cases, few freshwater shells (*Physa*), one valve of a river mussel shell (*Unio angasi*), pieces of tea lead, three large, green cigar-shaped pods of the native silk-vine (*Marsdenia leichhardtiana*, F. v. M.), &c. The bower was 18 inches long, the walls of which stood 1 foot high, and the passage-way was 8 inches across inside. It pleased me to find the birds occupying their play-grounds, as it went to show that probably they had some inclination to breed, notwithstanding the dry period then existing.

NEW BIRD.

A Fly-eater (*Pseudogerygone*), referred to later, was frequently heard to-day. The bird puzzled me, and has since turned out to be a new species, which has now been recorded as the Reddish-crowned Fly-eater (*Pseudogerygone jacksoni*, Campbell)—*vide* *Emu*, vol. xi., p. 247. Altogether eight of the birds were collected during the trip, also five nests and five sets of the eggs (*vide* *Emu*, vol. xi., p. 249).

To-day I again came across many Emus (*Dromæus nova-hollandiæ*) of starved appearance, and disturbed several Bush-Curlews (*Burhinus grallarius*). Noticed old and new nests of two species of Babblers (*Pomatostomus temporalis* and *P. superciliosus*), also birds. The latter species is not noisy, and builds chiefly in the native lime trees (*Atalantia glauca*, Hook.) on the plain to the east of my camp, some of these trees being 16 to 20 feet high. Although *P. superciliosus* is the smallest species of the genus, they often construct immense nests. The Crested Oreoica or Bell-Bird (*Oreoica cristata*) greatly interested me; it renders a peculiar and uncommon note, which resembles somewhat—"Te—Te—T T T—Te wock wock"; the first two and the fifth note have a slight pause after each, though these first six are rendered rapidly and are bell-like, while the last two notes ("wock wock") are in a much lower key, and not unlike some of those made by the Butcher-Bird (*Cracticus destructor*). The beautiful Bicheno Finch (*Stictopectera bichenoviæ*) was plentiful, and found nesting freely, and one nest containing four eggs was built in a broom tree (*Apophyllum anomalum*, F. v. M.) at a height of about 5 feet from the ground. A handsome nest of the Striped Honey-eater (*Plectorhampus lanceolatus*) was found just ready for eggs, and placed at the extremity of a drooping branch of a green belah tree (*Casuarina lepidophloia*, F. v. M.) which was about 16 feet from the ground. Grey Struthideas (*Struthidea cinerea*) were plentiful and noisy, but Magpies (*Gymnorhina tibicen*) scarce. Great numbers of trees are attacked by mistletoe and other parasitic growths, of which there are a good number of species. The leopard-wood (*Flindersia maculosa*, F. v. M.), which has a peculiarly spotted bark, was in particular a host for the yellow-blossom mistletoe (*Loranthus quandang*, Lindl.), and it was in these large and dense growths that the

various birds often built and concealed their nests from the hungry eyes of the Hawks, countless Crows, and goannas (*Hydrosaurus varius*).

23rd September.—Out walking all to-day, and covered much ground, but saw no signs of Bower-Birds, except the pair which have the bower at my camp. Found nests getting built of the Short-billed Tit (*Smicrornis brevirostris*) in the tops of small budda trees (*Eremophila mitchelli*, Benth.), also those of Yellow-rumped Tit (*Acanthiza chrysorrhoa*). Found *Acanthiza albiventris* (North), plentiful, and feeding in the remarkable undergrowth of the young leopard-woods, and later secured specimens for identification. Saw fine pair of Bronze-wing Pigeon (*Phaps chalcoptera*) feeding on the parched ground under some dead belah trees. The Crested Pigeons (*Ocyphaps lophotes*) were very plentiful. They are a most graceful bird. When flying they make a strange metallic sound with the wings, not unlike the sound produced by a small tin windmill revolving. Found a pair of Black-and-White Fantails (*Rhipidura tricolor*) building in a wilga (*Geijera parviflora*, Lindl.) close to No. 1 bower. Again noticed a pair of Magpie-Larks (*Grallina picala*) fighting with a flock of nine Grey Struthideas. The disturbance was over the nest, the Struthideas trying to take unlawful possession of that which was built by and belonged to the Grallinas. Have several times witnessed this kind of thing. Found the nest of a Crow (*Corvus coronoides*) placed high up in a coolibah (*Eucalyptus bicolor*, F. v. M.), and the bird sitting. Greatly enjoyed watching with field-glasses the pair of Bower-Birds at No. 1 bower near camp. They usually leave the play-ground for a few hours before noon, and then again later on in the afternoon. They danced and hopped in their side-step fashion round and through the passage-way of the bower, and kept up a great noise most of the time; then they would fly away and shortly afterwards return with some seed-pod or berry, piece of glass, or other object for the decorations. They do not appear to walk, but always hop, and mostly with the rather sidelong step that I have mentioned. One bird had a beautiful lilac band at the nape of the neck, which it often erected fanlike for a few seconds at a time. It was probably a male (up to this time I could not afford to shoot any of these birds for examination), and it visited the wilga leaning over my tent early this morning, and flew down and hopped about at the tent door, only a few feet away, and turned its large, dark eyes towards me as it picked up crumbs on the tent floor. Up to this time the birds showed no signs of mating, as far as I was able to detect.

It was a pretty sight at the time of the golden sunset to see the numerous pairs of Rose-breasted Cockatoos (*Cacatua roseicapilla*) and other birds, both large and small, flocking in from miles round and drinking at the edge of the clay tank close to my camp; the hundreds of red breasts of these Cockatoos and their white caps reflecting in the mirror-like water beneath them was a picture worth going a long way to see. Some walked into the water and cooled their legs while drinking, and others sat on lumps of clay on the sloping bank and kept dry outside. Saw several Native Companions (*Antigone australasiana*) and White-necked Herons (*Notophox pacifica*) to-day, some picking about on dried and baked-up warrambools (bog-holes).

24th September.—Was awakened this morning before 6 o'clock by a Bower-Bird making its curious, harsh call in the tree leaning over my camp, then it flew down and examined some empty jam-tins near, and finally flew across the sheep or clay tank to the bower. On going over to the tins I found that three greengage plum seeds that had been thrown into one of them had gone; probably the bird had removed them for the purpose of the bower decorations. Some silver or tinfoil paper was then secured, folded into four small squares, and thrown in front of the tent, and in an hour they had disappeared. It was my impression that this pair of birds at No. 1 bower may possibly breed about this part; if a supply of material for the

decoration of their play-ground could be daily supplied it might thus, perhaps, prevent the birds going far afield for it, and running the risk of being shot by the selector, who mercilessly kills them when he can, as he looks upon them as great marauders on his few treasured fruit trees.

No. 1 bower, near camp, was not visited too often, as I feared hunting the birds away altogether; when a visit of inspection was made it was cautiously carried out, and when both birds were absent. Anything I put in the play-ground, purely as a means of experiment, the birds at once rejected, and re-adjusted any decorations I might have moved. Saw flock of 21 Grey Struthideas, and they made a fearful noise. This bird's note resembles the sound made by a person running along beside a stone or sand-plastered wall and pressing a stick firmly against it as he proceeds, and every now and then lifting it off. Noticed many handsome Crimson-winged Lories (*Ptilistes erythropterus*), Barnard Parrakeets (*Barnardius barnardi*), and Crimson-bellied Parrakeets (*Psephotus hamatorrhous*); some were in the bush, and others were drinking at the sheep-tank. Had heard or seen no Cuckoos up to date. Found several new nests of *Acanthiza chrysorrhoa* pulled to pieces and hanging in the trees and bushes. The White Cockatoos (*Cacatua galerita*) seldom come about my camp; they keep to the much taller and larger timber on the banks of the Moonie River, a few miles to the east. Ants of many species are most troublesome, covering everything in camp. On travelling away from the sheep-tank (especially north, west, or south of camp) bird-life became scarce, and it gradually increased again as other water was approached miles away.

25th September.—Climbed to the nest of a Crow (*Corvus coronoides*) in a coolibah at 6 a.m., and found it to contain two young birds (about two days old) and an addled egg. Nest placed up 50 feet, and thickly lined with a deep layer of Emu feathers. While climbing this tree I noticed, when the loose bark fell off, that the trunk and limbs were covered in many places with countless small land-shells or bush-snails clinging and quite firmly fastened on, and apparently ready to hibernate for a dry spell. The bark being removed, the Babblers and Struthideas soon saw these small living shells, and spent some time picking them off the tree; they belong to the genus *Succinea*. Other trees then examined also were covered with many of these tiny shells, and almost every tree from which I lifted loose bark revealed these small mollusca (living, though for the time being stationary). A number of birds ate the shells when I took off the bark. Mr. Chas. Hedley, F.L.S., Conchologist and Assistant Curator of the Australian Museum, Sydney, has since inspected some of these shells, and believes they are new to science. It seems remarkable how these shells exist in such an arid place and season as this.

Visited No. 1 bower to-day, and found the missing squares of tinfoil paper stuck into the upright grass of the passage walls and facing the passage; also one of the missing greengage plum seeds was found. Near the bower was noticed one of the Bower-Birds patiently collecting and feeding on small insects which it was obtaining from the leaves of a coolibah (*Eucalyptus bicolor*, F. v. M.). Three birds were at this No. 1 bower to-day, and not two, as has been the case all along. Two birds had lilac napes, and one was without. I went away some distance with the field-glasses to watch the birds, and every now and then they took it in turn to fly to my tent on the east side of the sheep-tank. One of them mimicked the notes of the Magpie (*Gymnorhina tibicen*) to perfection, and in addition to this rendered a sound exactly resembling that of sheep getting through a wire fence. The imitation was wonderful, reproducing a metallic rattle and ringing exactly like the sound from the vibrating wires when sheep or Emus go through. This clever bit of mimicry must be heard to be fully appreciated. I got the first good view of the Reddish-crowned Fly-eater (*Pseudogerygone jacksoni*), and found the first nest in course of construction. The nest was built about 9 feet up, and suspended from the

foliage of a clump of bible box suckers (*Eucalyptus populifolius*, Hook.) growing from the base of a ringbarked tree, and it contained three eggs on 9th October (*vide* *Emu*, vol. xi., pp. 248, 249). Found two more nests of the Crow (*Corvus coronoides*) built high up in giant carbeen or Moreton Bay ash (*Eucalyptus tessellaris*, F. v. M.); birds flew from each. The trees were growing on a sand-ridge which had been colonized by rabbits and converted into a warren. Carpet snakes and goannas raid these numerous burrows and destroy many of the young rabbits. The tracks of the snakes, in particular, were numerous and very plain on the sand, and I noticed where a large carpet snake had gone from one burrow to another. Saw two Mistletoe-Birds (*Dicaeum hirundinaceum*). No doubt these little birds are common, and are more or less responsible for the vast quantities of the mistletoe and kindred parasitic growths in the trees. Many small birds build in them; specimens of all of them were therefore collected. From observations, I concluded that between 70 and 80 per cent. of the trees were infested. Never before have I noticed such a quantity, and so many species. The numerous native lime trees (*Atalantia glauca*, Hook.), which many of the smaller birds build in, were in blossom, and their fragrance was delightful. The trees grow up to 16 or 20 feet in height. Saw three Yellow-legged Spoonbills (*Platibis flavipes*) and a pair of Native Companions (*Antigone australasiana*); the local native name for the latter bird is "Broilga." When a few miles to the east of my camp a Spotted Bower-Bird flew past, and went towards some dirty water. I thoroughly examined the part from which it appeared to have flown, and was rewarded by finding another new and beautiful bower (No. 3), which ran north and south. It was hidden under the low, drooping limbs of a green wilga (*Geijera parviflora*, Lindl.), and the branches just touched the tops of the upright twigs and grass of the walls of the bower. It was an unusually long one, and measured almost 2 feet through the passage; walls constructed of the dead stems of the blue-grass (*Andropogon sericeus*, R. Br.) In this passage-way the decorations consisted of one galvanized iron roofing screw, one large green cigar-shaped pod of the native silk-vine (*Marsdenia leichhardtiana*, F. v. M.), some small pieces of glass, and a seed-pod of the cypress pine (*Callitris robusta*, R. Br.), a belt of which was growing close by on a sand-ridge. At the ends of the bower, and opposite the passage-way, were several bleached bones of sheep and Emus, a few small pieces of cuttlefish-shell, pieces of coloured glass—viz., green, white, blue, and brown—also a few curled and narrow clippings of galvanized iron, and some beautiful and perfect heart-shaped berries (*Pittosporum phullyroides*, DL.) While examining the bower nothing was touched. I then stood in the shade of another green wilga not far off, and a Bower-Bird (having no lilac nape visible) flew down from a dead tree on to the ground right beside me. It had a long, flat seed-pod like that of a wattle (*Acacia*) in its bill. It then hopped over to the bower and placed the pod at the southern end amongst the other articles of decoration, thence on to a low limb over the play-ground, and from there went up by a succession of hops until the top of the tree was reached. I marked the place, and moved on and hunted all the likely places about for a nest, but failed to find the trace of any. At this part I came across a pair of Black-backed Wrens (*Malurus melanonotus*). They were dodging about and feeding amongst the salt-bush (*Rhagodia spinescens*, R. Br.) The bower (No. 3) found to-day a few miles east of camp now places all the three play-grounds found to date over 2 miles apart one from the other, and all handy to the Moonie River, which stream (now mostly dried up) lies nearly 3 miles east of my camp. Saw some old Eagles' nests.

26th September.—Crows' nests contained young birds almost able to fly. The Bower-Birds at No. 1 bower were backwards and forwards to the camp for some time to-day, collecting articles for decorative purposes, and they did some nice dancing, hopping, and side-stepping, keeping up their

curious harsh notes all the time. One visited the front of the tent early this morning, and was busy at the empty jam-tins; it came quite close to me as I was having breakfast. Heard another *Pseudogerygone jacksoni* calling sweetly again to-day. Also for the first time came across the vine of the native silk (*Marsdenia leichhardtiana*, F. v. M.), the long cigar-shaped pods of which the Bower-Birds often place in their play-grounds. When these are removed from the vine the stem at point of fracture exudes a white milky and sticky fluid. The vine does not grow thickly, creeps on trees, and has a long, narrow leaf, with the pods suspended like small cucumbers. Bower-Birds collect them when firm and green. When ripe these pods turn brown, burst on one side, and all the beautiful silky fluff and seeds are scattered by the wind; the flowers were glossy and of a creamy-yellow colour. Inspected No. 2 bower to-day, about 3 miles north of the camp; found it in good order and full of decorations, including some of the native silk pods. None of the Bower-Birds shows any signs of breeding yet.

27th September.—Great wind storm last night from south-west, but the camp stood well. A Bower-Bird (no lilac nape) at camp again before 6 a.m. Saw flock of three Black-breasted Plovers (*Zonifer tricolor*) at the sheep-tank this morning, also seven Yellow-legged Spoonbills (*Platibis flavipes*). Found another nest of *Pseudogerygone jacksoni* nearly completed and placed up about 9 feet in the suckers growing from the base of a ring-barked coolibah (*Eucalyptus bicolor*, F. v. M.) Saw a pair of the Barnard Parrakeets (*Barnardius barnardi*) sitting in a dead tree near a hollow. On the west of the camp is an extensive plain on which some handsome gruie or Emu apple trees (*Owenia acidula*, F. v. M.) are growing; they give splendid shade, and the Emus often rest under them, and eat the fruit when they can reach it. Saw a number of small nests pulled to pieces again to-day, and hanging from the trees; I think the goannas do a lot of this damage as well as the Crows. On entering a belt of cypress pine (*Callitris robusta*, R. Br.) I saw a handsome Red-capped Robin (*Petrarca goodenovi*, V. and H.); this bird utters a feeble note resembling the cricket-like cry or call of a small frog. Here I visited a large bumbe or wild orange tree (*Capparis mitchelli*, Lindl.) leaves; much attacked by a scale insect (*Lecanium*, sp.) Two Babbblers (*Pomatostomus superciliosus*) were picking the scales from some of the leaves. Came across a small wild fuchsia tree (*Eremophila maculata*, F. v. M.)—it has a pretty, bell-like red flower, and belongs to the *Myoporineæ* family. The seed berries the Bower-Birds place in their play-grounds—have noticed several therein. While having my tea at dusk a pair of Native Companions flew past the tent and down to the sheep-tank; have noticed the call of this bird is sometimes rather like some notes uttered by the Channel-bill Cuckoo (*Scythrops novæ-hollandiæ*). Not many Crows about the tank to-night; as a rule a great number turn up for a drink at sundown. Saw a Bower-Bird drinking late this evening, and noted that it flew directly eastwards across the plain. Additions to No. 1 bower inspected to-day were:—Two new galvanized roofing nails with the wide dump-like head, also a piece of cuttle-fish (*Sepiidae*) shell, and some freshly-plucked red coolibah (*E. bicolor*, F. v. M.) leaves (young). The new nails and cuttle-fish shell the birds must have picked up about a homestead or a Chinaman's camp, and the nearest house is at Cambo Cambo, over 3 miles away. Lignum bush (*Muehlenbeckia cunninghami*, F. v. M.) grows near the camp, but most of it is dead; this is also the case with the nardoo plant (*Marsilea drummondii*, A. Br.) The latter has a silky leaf, greyish-green in colour and clover-like in shape. Emus eat the leaves when they can get them, and often pass them out again in a caked mass; the seeds they also eat. The Crested Bell-Birds (*Oreoica cristata*) call out all round mostly just after sunset and up till dark; one of them roosts very often in a bunary tree (*Heterodendron oleaefolium*, Desf.) close to the camp. Saw many of the poisonous red-backed spiders (*Latrodectus hasselti*) when getting firewood,

and noticed the Restless Flycatchers (*Sisura inquieta*) eating them. Two careworn-looking Emus came up to the camp in an inquisitive way after sundown, also a few kangaroos. Saw some Wedge-tailed Eagles (*Uroaetus aulax*) and Whistling Eagles (*Haliastur sphenurus*) about. Noticed a flock of several of the little White-browed Babblers (*Pomatostomus superciliosus*) moving amongst the native lime trees (*Atalantia glauca*, Hook.) east and north-east of the camp to-day.

28th September.—A Bower-Bird at camp early again. Visited the new nests of Short-billed Tit (*Smicrornis brevirostris*) and Striped Honey-eater (*Plectorhamphus lanceolatus*), and was disgusted to find both pulled to pieces. Found another new nest of *Pseudogerygone jacksoni* being built in snackers growing up from the base of a ring-barked coolibah tree, and placed about 8 or 9 feet from the ground. Heard a Narrow-billed Bronze-Cuckoo (*Chalcococcyx basalis*, Horsf.) this morning; this is the first Cuckoo noted. Other birds noted to-day, and for the first time since my arrival, were:—Oriole (*Oriolus sagittarius*), Chough (*Corcorax melanorhamphus*), Leather-head (*Tropidorrhynchus corniculatus*); and noticed the Spiny-cheeked Honey-eater (*Acanthogenys ruficularis*) plentiful, also the Mistletoe-Bird (*Dicaeum hirundinaceum*). Came across some Emu droppings full of prickly pear (*Cactus*) seeds. I noticed that from some of the old ones dozens of young prickly pear plants were growing; they were club-shaped, and measured 1 inch high. Where these were growing there were no old or developed plants within a few miles or more, so the Emus appear to distribute the seeds over big areas. Saw a pair of beautiful Crimson-bellied Parrakeets (*Psephotus haematorrhous*) feeding in a bumble tree (*Capparis mitchellii*, Lindl.) which was loaded with its unripe large, round, and green fruits—these the birds were opening in order to get at the pink pomegranate-like seeds. In fact, when the fruit is broken open before ripe, it has the perfume and appearance of pomegranate inside. The tree is usually thorny, with light to dark green foliage, not unlike that of an orange tree in general appearance, hence the name of wild orange or bumble. When ripe the fruit is soft and something like a passion fruit in its internal consistency, and contains many hard flat and kidney-shaped seeds. The Bower-Birds eat the fleshy part of the fruit when ripe, and often leave only the rind hanging in the trees. The fruit grows singly on a long stem. Some are 8 inches in circumference. During a long walk to-day I saw no more Bower-Birds, and was much disappointed. Three birds were at No. 1 bower near the camp. Bush mice most troublesome in camp, and busy at the "tucker" box. When having some lunch to-day at camp a Bower-Bird hopped beside me, and looked up as if asking for more jam; generally a little was put out every night in a special tin, and the bird never failed to come next morning for it. Had several shots at some Crows late yesterday, throwing the empty cartridges down in front of the tent, and this morning they had gone; probably they were taken by the Bower-Birds for their play-ground (No. 1). Went north-west from camp after a storm. I found the ground a bit sticky, and many birds were drinking from the small pools of water here and there on the hard ground. Saw numbers of snails (*Succinea*), over half an inch long. The ground was well covered with them at certain parts, and they appeared to come from the bases of tufts of dead grass, where they often live after growing large, and coming down from under the bark on the trees. A person would never think such things as land-shells or snails could exist on such baked and dry ground, and in such heat. A large black ant (*Ectatomma mayri*) that is found here uses these dead *Succinea* shells for placing round the mouth of its nest or hillock, and those selected are usually bleached pure white and long dead. Samples of ants and shells were collected for identification. Noticed that the Barnard Parrakeet often utters a peculiar cluck-like note, not unlike that rendered by the female of the Caterpillar-eater (*Edolisoma tenuirostre*). Heard a Bronze-Cuckoo (*Chalcococcyx plagosus*) to-day, the first of this particular

species since my arrival here. Numerous small coffee-coloured gecko lizards about the bush; these harmless little things belong to the family *Geckonidae*, and are eaten by the Hawks. About the camp there is a quantity of dead and leafless ringbarked timber, and it is not easy to detect the Emus when they are standing amongst the dead timber, owing to their similarity in colouring. Heard some wild Ducks splashing and calling out in the sheep-tank after dark, probably Black Duck (*Anas superciliosa*).

29th September.—Went northwards, and saw several Emus. Saw many poisoned rabbits lying about in the sandy parts of the bush. Walked south later for a visit to No. 3 bower, and saw a Bower-Bird there; it flew to the play-ground and placed therein a piece of bleached Emu egg-shell; the bird had a small lilac patch on its nape. In the passage-way was a heap of 30 or 40 green seed-pods of the cypress pine (*Callitris robusta*, R. Br.) Only one bird noticed at or near this bower. Among the additions to the decorations of this bower since last visit, was the small claw of a fresh-water lobster or crayfish (*Cheraps bicarinatus*), much bleached. The bird flew into a dead coolibah near and cried out loudly a few times, and then returned to the bower. I kept myself in hiding, and watched from 10 a.m. until noon, and the bird kept flying into dead trees about and then back to the bower. Moving on, every likely tree for a nest was examined, but no trace of one was seen. Saw the Black-backed Wrens amongst the salt-bush, about 100 yards from No. 3 bower. They were feeding three short-tailed young ones, and made a great fuss as I approached, fluttering all over the ground as if wounded. Saw numbers of Chestnut-eared Finches (*Tamiaspygia castanotis*) feeding on the ground under a budda tree (*Eremophila mitchelli*, Benth.) Just here saw a large blue-tongued lizard, known in these parts as a "scaly-back" (*Trachysaurus rugosus*). The back has large scales which resemble the skin of a pine-apple; Hawks and Eagles capture these lizards. Passed several beautiful grue or Emu apple trees (*Owenia acidula*, F. v. M.), the leaf of which is somewhat like that of the introduced pepper tree (*Schinus molle*, Linn.) Bush mice have played havoc in the flour bag at camp.

30th September.—Bower-Birds at camp early this morning, but only one was noticed at No. 1 bower during the day, and it would fly or hop up into the wilga tree over the play-ground and there preen its feathers for about half an hour. A visit would then be made to the bower, and various fallen leaves would be thrown out, after which it would return to its tree again and there sit cleaning itself, or fly over to my camp and return with an empty cartridge case or other trifle for the play-ground. At last it flew to the top of a dead coolibah tree and called loudly "Kar-r-r-r-r" three times, then afterwards flew in a direct line north-east, and in an undulating flight but a straight line towards Cambo Cambo homestead. A visit was made to the bower and I found seven of the long green cigar-shaped pods of the native silk-vine (*Marsdenia leichhardtiana*, F. v. M.) in the passage-way. Noticed many Miners (*Myzantha garrula*) about. Laughing Jackasses (*Dacelo gigas*) are scarce. Came across Grey Struthideas building their mud nest in a white-wood tree (*Atalaya hemiglanca*, F. v. M.) near the clay sheep-tank. Noticed dead fresh-water shells (*Physa*) at a hollow and cracked part to-day that at one time evidently held water; these shells, which when alive are frequently eaten by water-fowl, are said to be often the intermediate host of the fluke. Visited No. 3 bower, and only one bird, with a lilac nape, was there.

1st October.—Nothing to note.

2nd October.—Walked round to the northern end of the plain, west of camp, and, still going north, met with another large plain. Struck a bore drain at the boundary of Cambo Cambo and Goondooblue stations; the drain was about 6 feet across and 18 inches deep, and travelled over the flat country, watering sheep, &c., for miles. Came across a solitary Black-

breasted Plover (*Zonifer tricolor*) wandering about on a piece of barren, baked ground. Saw another *Pseudogerygone jacksoni*; this little bird renders a feeble but sweet little song. Amongst other birds noted to-day were:—Rufous-breasted Thickhead (*Pachycephala rufiventris*), Bronze-Cuckoo (*Chalcococcyx plagiatus*), Pied Robin (*Petroica picta*), Brown Hawk (*Hieracidea berigora*), Kestrel (*Cerchneis cenchroides*), White-shouldered Caterpillar-eater (*Lalage tricolor*), Brown Tree-creeper (*Climacteris picumna*), Black-throated Butcher-Bird (*Cracticus nigrigularis*), Bee-eater (*Merops ornatus*), Blue-faced Honey-eater (*Entomyza cyanotis*), White-plumed Honey-eater (*Ptilotis penicillata*), Friar-Bird or Leatherhead (*Tropidorhynchus corniculatus*), Yellow-throated Friar-Bird (*Philemon citreogularis*), Spiny-cheeked Honey-eater (*Acanthogenys rufigularis*), White-shafted Fantail (*Rhipidura albiscapa*), rare; Swallow (*Hirundo neoxena*), Little Turtle-Dove (*Geopelia cuneata*), Nankeen Heron (*Nycticorax caledonicus*), &c. The bell-like notes of the Crested Bell-Bird (*Oreocica cristata*) are often most difficult to locate; the sound sometimes appears as if close and overhead, yet the bird is perhaps some 60 yards or more away. The birds are becoming more plentiful, and four more of their old nests were noticed. Came across a very old and deserted play-ground of the Spotted Bower-Bird. The Grey Struthideas appear often to rebuild their old mud nests, and frequently the top part may be constructed of black mud and the lower portion of red. The cunnya tree (*Ventilago viminalis*, Hook.) here is remarkable; when it grows up isolated from other trees, &c., it develops into a tree growth, but if it happens to be near anything it can creep on it takes the form of a vine, and climbs all over the tree it touches; it is also known as supplejack. The wilga (*Geijera parviflora*, Lindl.), myall (*Acacia pendula*, A. Cunn.), and cypress pine (*Callitris robusta*, R. Br.) are often most graceful in shape, and afford good shelter for the birds on a very hot day. The fruit of the prickly nypang vine (*Capparis lasiantha*, R. Br.), when ripe, turns yellow and splits; it consists chiefly of hard, dark seeds. Noticed Spiny-cheeked Honey-eaters frequently fighting with the Friar-Birds, consequently some great tussles take place. Boobook Owls (*Ninox boobook*) sometimes heard at night, but they keep more to the larger trees on the Moonie River. Visited No. 1 bower near camp, and the decorations had been greatly augmented, and included (in passage-way) eight green pods of the native silk-vine, two galvanized roofing screws, three galvanized dump-headed nails, three new wire nails, five pieces of tinfoil paper, one bluish stone, two empty cartridge cases, two pieces green glass, one clear-glass ring from neck of bottle, six seed-pods or cones of the needle-wood tree (*Hakea leucoptera*, R. Br.), and a few small, fresh, glossy leaves of the coolibah (*Eucalyptus bicolor*, F. v. M.) Out in front of the south end of passage the following were amongst the articles displayed:—24 glass corks or stoppers from sauce bottles, one jam-tin lid, one dump-headed nail, one piece of galvanized iron clipping, measuring about 8 inches long by 1 wide, and tapering to a point; 33 vertebra bones from sheep, 39 smaller bones, six green seed-pods from the cypress pines (*Callitris robusta*, R. Br.), and numerous pieces of glass. In front and facing the northern end of the passage-way were displayed 19 sheep and Emu bones, 13 pieces of variously coloured glass, two seed-pods of the needle-wood tree, and five green seed-pods of the Cypress pine, &c. This bower (No. 1), having been built on the site of some Chinamen's old camps, enables the birds, therefore, to collect many objects from the scattered litter thereabouts, and the new nails and pieces of galvanized iron clippings the birds have probably collected about the new house lately erected at the Cambo Cambo homestead. Saw a Bower-Bird carrying a thin stick in the bush, and followed the bird till the stick was placed upright in the walls of No. 1 bower, amongst the dead and upright grass-stems. The bird flew away and collected several more thin twigs, and placed them neatly in position in the play-ground. It then flew

up into a coolibah tree, and for fully 10 minutes captured insects from small swarms that flew from underneath a loose piece of bark. The insects appeared to be the small native bees or flying-ants. The bird returned to the bower and added more twigs and grass-stems. The mate then arrived, and both set to work at the play-ground until dusk. They next went to the sheep-tank for a drink, and finally roosted in a coolibah tree not far from the camp.

3rd October.—Visited No. 3 bower, to the east of the camp. No less than three Bower-Birds were busy at work, and bursting with what one might term "bird vanity." They divided their time between collecting oddments, making noises, and dancing about admiring the result, and, incidentally, showing themselves off. The æsthetic and artistic instinct is evidently very strong in these quaint birds, and shows itself in their devotion to the work of beautifying their bowers, whilst their vanity and love of display (dancing and posturing) is no less obvious, and particularly in the constant "fanlike" erection of the feathers forming the lilac-coloured napes. I remained in hiding and watched them with the field-glasses, on and off, from 7 a.m. to 11 a.m., and found the result amply repay me for the trouble taken. Saw four Ground Cuckoo-Shrikes (*Pteropodocys phasianella*)—the first of these birds to appear. They utter a peculiar note, quite different to that of any of the other species of Cuckoo-Shrikes. Visited four of the nests of *Pseudogerygone jacksoni*. Two were ready for eggs, and two had been pulled to pieces by some bird or beast. The birds of the latter were found busily engaged rebuilding again in coolibah saplings, not far from the destroyed nests. Many Pied Robins (*Petroica picata*) about.

4th October.—Saw several curah trees (*Eremophila bignoniflora*, F. v. M.) to-day, from the large blossoms of which many Honey-eaters feed. Mr. J. H. Doyle informed me that the natives at one time used the wood of this tree for fire-making, by rapidly rotating one piece on another. Came across the remains of a bower which a bush-fire had lately passed over, leaving nothing save numerous bone and glass decorations and other solid objects. One of the station hands working at the sheep-tank to-day told me that when this bower was used by the birds he had found in it the silver-plated handle of a shaving-brush. Nypang vines are starting to flower, and have a delightful aroma, not unlike the garden honeysuckle.

5th October.—This morning many birds were busily calling near camp at 10 minutes past 5, and the Brown Flycatcher (*Micra fascians*) was the first whose note was heard. Investigations led me in a north-westerly direction to-day. Indications of the 1902 drought were again evident everywhere, and countless green trees which had been lopped of their limbs for fodder, have since thrown out a vigorous growth of branches; the wilgas especially have in many cases developed into full and symmetrical forms. Noticed three Grey Struthideas busily engaged building their cup-shaped nest of mud, which was placed on the horizontal limb of a belah tree (*Casuarina lepidophloia*, F. v. M.). Passed some large flocks of Rose-breasted Cockatoos (*Cacatua roseicapilla*, Vieill.) feeding quietly, probably on the fallen seed, on the ground under cypress pines. Spiny-cheeked Honey-eaters were frequently observed extracting nectar from the long yellowish bell-shaped flowers of the curah trees. Noticed large silver-leaved ironbark trees (*Eucalyptus melanophloia*, F. v. M.) growing on sandy parts, some being nearly 3 feet in diameter. Eagles' nests are often seen in them. A Bower-Bird flew overhead when I was some miles to the north-west of the camp, near the Goondoobluie bore drain, which passes through the western end of Cambo Cambo property.

6th October.—Walking east to-day I passed clumps of lignum bush (*Muehlenbeckia cunninghami*, F. v. M.) 8 feet high. Two Bower-Birds were at No. 3 bower. Among articles added to the decorations were:—

Three glass corks or stoppers from sauce bottles, more Emu egg-shell bleached white, piece of very old wooden pipe-stem, three small curled up galvanized iron clippings, two long, green cigar-shaped pods of the native silk-vine (*Marsdenia leichhardtiana*, F. v. M.), &c. This bower (No. 3) is placed quite close to the skeleton and scattered remains of an old and isolated wooden house, which is completely wrecked and laid flat. No doubt the Bower-Birds collect glass and other objects for their play-ground round about the ruins. I sat in hiding, and again watched the two birds at this bower in order to see if there were any signs of mating. One bird hopped bit by bit until it got within 3 feet of where I was, and after remaining for four or five seconds, and looking inquisitively towards me, flew straight back to the bower. The small Barcoo flies (a species of *Muscide*) are most troublesome, and are constantly getting down one's throat and into one's eyes. I found another nest of the Reddish-crowned Fly-eater (*P. jacksoni*) being built in the suckers springing from the base of a ring-barked coolibah. Shot a Pardalote for identification, which proved to be *Pardalotus ornatus* (Temm.) Noticed many masses of the black grubs or larvæ of a species of saw-fly (*Perga*) on the green leaves of the coolibah suckers. Large lumps of clear gum are often seen on the trunks of the native lime trees (*Atalantia glauca*, Hook.), and it makes a good adhesive for camp use. After mid-day I travelled west, and found a nest of Brown Hawk (*Hieracidea berigora*) placed about 80 feet up in a tall belah tree (*C. lepidophloia*, F. v. M.); bird flew off. Came across great quantities of nypang vines (*Capparis lasiantha*, R. Br.) growing on the trees some 3 or 4 miles west of camp. Here were noticed two Bower-Birds feeding from the leaves of a green coolibah tree; they appeared to be collecting small insects. They soon vanished, and no sign of a nest could be found anywhere about. The ground at some parts is fearfully cracked, especially about old warramboos, the fissures being large enough for a man to put his foot into. Noticed many dragon-flies (*Odonata*) hovering about over the plain to the west of the camp to-day; one would not expect to see so many of these aquatic insects in such dry country and so far from water. Friar-Birds were chasing some of them, and in many cases were successful in capturing their victim. Found the first nest of the Spotted Bower-Bird to-day, but it was very old, and placed up 18 feet in a cunningyanna tree (*Ventilago viminalis*, Hook.) west of the camp, constructed of sticks, and lined inside with smaller ones.

7th October.—Crumbs which I put at my tent door late last night for the Bower-Birds were appreciated by them, and they were picking them all up at 5 a.m. Tramped northwards to-day, and passed No. 2 bower under the boobialla tree (*Myoporum acuminatum*, R. Br.), and found it in good order. Two birds were at it. At the present time these birds are in pairs at all the three bowers now under observation. The trees all about these bowers for a good distance have been repeatedly examined for nests. I am of opinion they do not build very far from the play-ground. Total of different species of birds identified to date is 96.

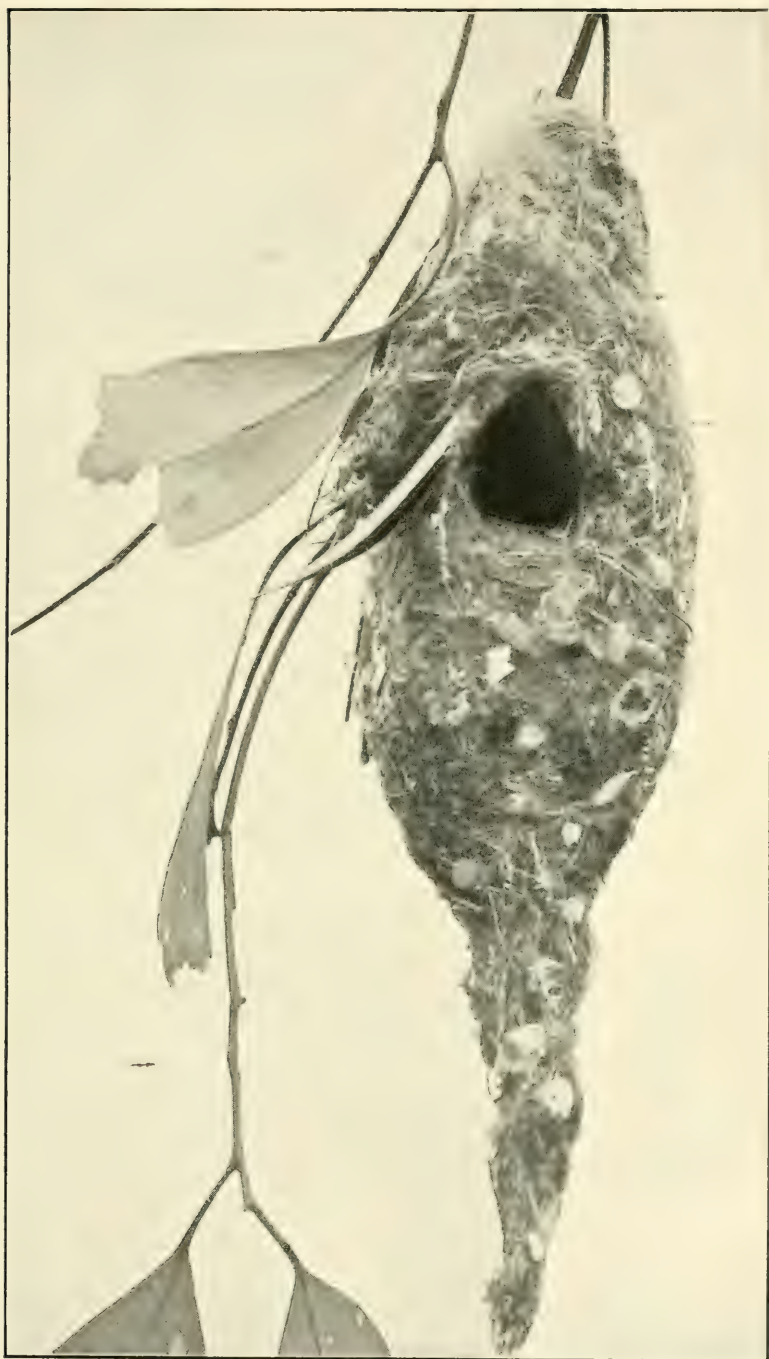
8th October.—Last night for some hours a Pied Robin (*Petroica picta*) perched itself in a native lime tree near the camp, and kept up a moonlight serenade; the night was calm and very clear. These birds call at night (when moonlight) much more distinctly than during the day, and not nearly so rapidly. The night note resembles—"Wheaty—canyer—canyer—wheat." Also—"Wheat (pause)—wheaty—canyer—canyer—wheat." The first and last words (or notes) are of the highest pitch. After arriving here, and before being properly acquainted with the call of this bird, my assistant and I tramped about the bush one moonlight morning about 2 o'clock to try and find out what bird it was. Saw no more Bower-Birds to-day. Plenty of large goannas about the trees.

9th October.—Strong westerly wind blowing, and notes of very few birds

heard. The wind made things unpleasant in the bush. Took two nests and two sets of eggs (one of three and one of two) of *Pseudogerygone jacksoni*; these I have been watching closely for some time. The set of three eggs are the types, also the nest. (Plate VIII.) Also vide *Emu*, vol. xi., p. 249. Took clutch (three eggs) of *Acanthiza chrysorrhoa*; nest built in the foliage of a leopard-wood tree. These birds are plentiful.

10th October.—Wind still blowing strongly from the west. Found an old bower hidden under the peculiar entangled ground growth of a young leopard-wood tree. It was certainly well hidden from the Hawks, and appeared a few seasons old. In the remaining decorations we found rusty buttons, stamped "Our own make." The walls of the bower measured 23 inches long. Among other articles in this play-ground were two glass stoppers from sauce bottles, pieces of tea lead, small stones, pieces of glass, &c. Visited No. 3 bower and found it in good order, but the birds had rearranged all or most of the decorations. Both birds were at it. The 30 or 40 seed-pods of the cypress pine which were in the passage-way during my last visit had all been shifted and piled up outside the northern end of the passage. Saw many very old traces of the aborigines to-day in the dead trees, and noted a number which had years ago been cut open (perpendicularly) by the blacks, probably when in search of opossums, or honey, &c. These blacks have since then nearly all died out in this part, and for those remaining a mission station has been established at Collarenebri. The large nardoo-stones which they used to carry about and grind the small nardoo seeds on when making their native flour are still occasionally found along the banks of the Moonie and Barwon Rivers and other parts of the district, but these implements are now becoming rare, more especially the perfect and unbroken ones. One resident showed me a splendid specimen which he picked up years ago.

Found nest of Whistling Eagle (*Haliastur sphenurus*) placed about 85 feet up in a large blood-wood tree (*Eucalyptus terminalis*, F. v. M.) Climbed to a nest of the Babbler (*Pomatostomus temporalis*) in a wattle tree (*Acacia longifolia*, Willd.), and found that it contained two eggs, slightly incubated. Saw eight handsome Barnard Parrakeets (*Barnardius barnardi*) feeding in the cypress pines and breaking open the green seed-pods. A fine male Black-backed Wren (*Malurus melanonotus*) was noticed to-day again at the same patch of salt-bush, and the female and the three young birds were with him. This is the only pair of these birds I have yet met with. In a dead coolibah tree a pair of Rose-breasted Cockatoos (*Cacatua roseicapilla*) had a nest in a hollow. Hunted a White-eyed Crow (*Corvus coronoides*) from her nest, placed about 70 feet up in a tall belah tree. Also found the nest of a Butcher-Bird (*Cracticus destructor*) about 45 feet up in a mass of nympang vines creeping over a dead belah, with bird sitting. Next was a handsome nest of the Lanceolate Honey-eater (*Plectorhamphus lanceolatus*) just ready for eggs, and built at the end of a drooping limb of a green belah. In another tall belah a Grallina (*Grallina picata*) was peacefully sitting on its mud nest at a height of about 65 feet. Struthideas were busy adding mud to the walls of three old nests in other belah trees close by. They must have carried the mud fully 2 miles from the nearest water. At this spot I disturbed five large kangaroos. Saw two Bower-Birds feeding on a few of the ripe fruits of the bumble tree (*Capparis mitchelli*, Lindl.) The fruit, when ripe, has a somewhat luscious flavour, but sometimes slightly hot. The Bower-Birds soon find the ripe fruit, and pick it clean. Counted 37 old nests resembling Pigeons', and probably belonging to the common Crested Pigeon (*Ocyphaps lophotes*), also 27 old and empty nests of the Babblers (*Pomatorhinus superciliosus* and *P. temporalis*).



Nest of Red-crowned Fly-eater (*Pseudogerygone jacksoni*).

With the glasses I observed a flock of seven Native Companions (*Antigone australasiana*) flying and circling at a very great height. They appeared like specks, yet their notes were audible, and I heard them calling long before I could see them. Ultimately, the birds stopped circling, and flew due south.

11th October.—Four Emus came up close to the camp this morning. Bower-Birds also came to visit me. Walked south-west, but nothing special noted. Decorations in No. 1 bower have again been rearranged by the birds, and many of the objects at the northern end of the play-ground have been transferred to the southern end, and *vice versa*. Birds playing in it to-day again, and displaying their lilac nape-frills. Found new nest of Crested Bell-Bird (*Oreoica cristata*) built in a wilga where fresh branches had grown from an old cut in the tree. Nest rather like that of Harmonious Thrush (*Collyriocincla harmonica*). The latter bird is very rare here. Saw huge mud nest of Chough (*Corcorax melanorhamphus*) built on a horizontal limb of bible box (*Eucalyptus populifolius*, Hook.), and placed up about 35 feet. This is the largest nest of its kind that I have ever seen. Saw numbers of Brown Tree-creepers (*Climacteris picumna*) about in the belts of dead belah timber, and out on a plain south-west from camp came across an Emu's egg, whole, but bleached pure white all over. Found nest of Soldier-Bird or Noisy Miner (*Myzantha garrula*) in green belah, containing two eggs, also saw flock of Straw-necked Ibis (*Carphibis spinicollis*) flying overhead. Worked round eastwards and visited No. 3 bower, at which were found two birds playing. To date I had not noticed more than three birds playing at and frequenting the one bower at the one time.

12th October.—Wind from the west. Found new nest of Crested Bell-Bird, placed in a dense and flowering mass of nypang vines (*Capparis lasiantha*, R. Br.) creeping over a green budda tree. Nest well hidden, and placed some 7 feet up. Found another old nest of Spotted Bower-Bird west of camp, and placed 20 feet from ground in the top of a dead and ring-barked budda tree. To-day I found the nest of a Whistling Eagle (*Haliastur sphenurus*), flushing the bird from it, but after a good climb of fully 70 feet up a dead belah tree (*Casuarina lepidophloia*, F. v. M.), the nest was found to contain only a few old bones. In a belt of dead and ring-barked belahs 13 nests of the Grey Struthidea (*Struthidea cinerea*) were examined, but all proved to be old or empty, notwithstanding the fact that the birds were near. Later my climbing was rewarded by finding one nest containing four eggs, placed only 8 inches from an old and rather flattened one. The nests are lined inside with dry grass-stems. The Crimson-bellied Parrakeets (*Psephotus hæmatorrhous*) have a very peculiar and uncommon call; I came across the birds frequently. Disturbed about a dozen kangaroos and four Emus. Flushed an Owlet Nightjar (*Egotheles novæ-hollandiæ*) from hollow limb of dead coolibah. Passed some handsome grue or Emu-apple trees on the plains; they are usually nicely shaped and give great shade. The fruit, when ripe, turns red, and contains a large, round, and hard woody seed, which constitutes the bulk of the fruit. Heard several Bush-Curlews (*Burhinus grallarius*) about to-night.

13th October.—Five Bower-Birds, which were quite tame, were feeding about at camp this morning. Walked northwards to-day; Found nest and two eggs of Barred-shouldered Dove (*Geopelia*

humeralis). I flushed the bird from a nest 14 feet from the ground on the horizontal limb of a green coolibah. Saw a fine Wedge-tailed Eagle (*Uroaëthus audax*) fly from a rabbit-infested sand-ridge, where, no doubt, it had been lying in wait for a dinner. Many poisoned rabbits were lying about, dried up like mere leather. Saw dead carpet snake, which probably had had a meal of poisoned rabbit. Saw numerous tracks of foxes and goannas on the sand about the burrows. Noticed that the native quinine trees (*Alstonia constricta*, F. v. M.) grew to a good size on the sandy patches about here. The Bower-Birds sometimes place the long, dry seed-pods of this tree in their play-grounds. Noticed some most handsome specimens of the Red-winged Lory (*Ptilistes erythropterus*) peacefully feeding in the native hop trees (*Dodonaea spathulata*, Benth.) growing on the sand-ridge. Several carbeen trees (*Eucalyptus tessellaris*, F. v. M.) were found here, some being very large and containing Whistling Eagles' nests. The bark is rough and in small square scales for 8 feet or so up, then the whole tree from that point becomes beautifully clean and smooth and rather white. Found nests of the following birds to-day:—*Podargus strigoides*, *Grallina picata*, *Struthidea cinerea*, *Pomatostomus temporalis*, *Plectorhamphus lanceolatus*, *Coracina robusta*, *Cracticus destructor*, &c., all built in green belah trees. I am hoping that the Bower-Birds may also breed shortly, notwithstanding the dry state of the country. The notes of the Striped Honey-eater (*Plectorhamphus lanceolatus*) are a peculiar rolling warble, and a little like those rendered by the Bee-eater (*Merops ornatus*). Noticed the Grey Struthideas again freely eating red beef-ants (*Iridomyrmex detectus*) to-day in front of the tent; the Bower-Birds do not like these ants crawling near them as they are feeding, and they constantly keep jumping or hopping away from the insects in a most comical manner, every now and then examining their feet. The Crested Bell-Birds (*Oreocica cristata*) rather silent lately; probably busily engaged nest-building. Bush-fires raging to-night in the neighbourhood.

14th October.—Heard Pied Robin (*Petræca picata*) calling early this morning. Found two nests of Black-throated Butcher-Bird (*Cracticus nigrigularis*) containing eggs. These birds often come about the camp and feed. Nest of Black-and-White Fantail (*Rhipidura tricolor*), containing three eggs, placed 5 feet from ground in the drooping limb of a green coolibah. Did not disturb them. Took set of four eggs of Struthidea. Sometimes no less than nine birds appear to belong to the one nest. Took handsome nest and set of three eggs of *Plectorhamphus lanceolatus*. *Coracina robusta* nest and three eggs in a coolibah. Nest of *Acanthiza chrysorrhoa* found, containing young. Saw flocks of White-rumped Wood-Swallows (*Artamus leucogaster*). Heard some Bower-Birds uttering their strong, harsh calls at a spot some few miles due north of my camp, and on going over in the direction of the sound I saw two Bower-Birds fly up into a dead coolibah from a dense and isolated wild red currant bush (*Exocarpus aphylla*, R. Br.), under which I found a handsome play-ground, well hidden from the Hawks, quite new and in splendid order. The tops of the upright twigs and grass-stems of the walls of the passage-way touched the low-spreading branches of the bush. This was bower No. 4. This bower runs east and west, and the decorations consisted chiefly of well-bleached vertebra bones of sheep, a pile of which to the number of about 200 was displayed outside the eastern

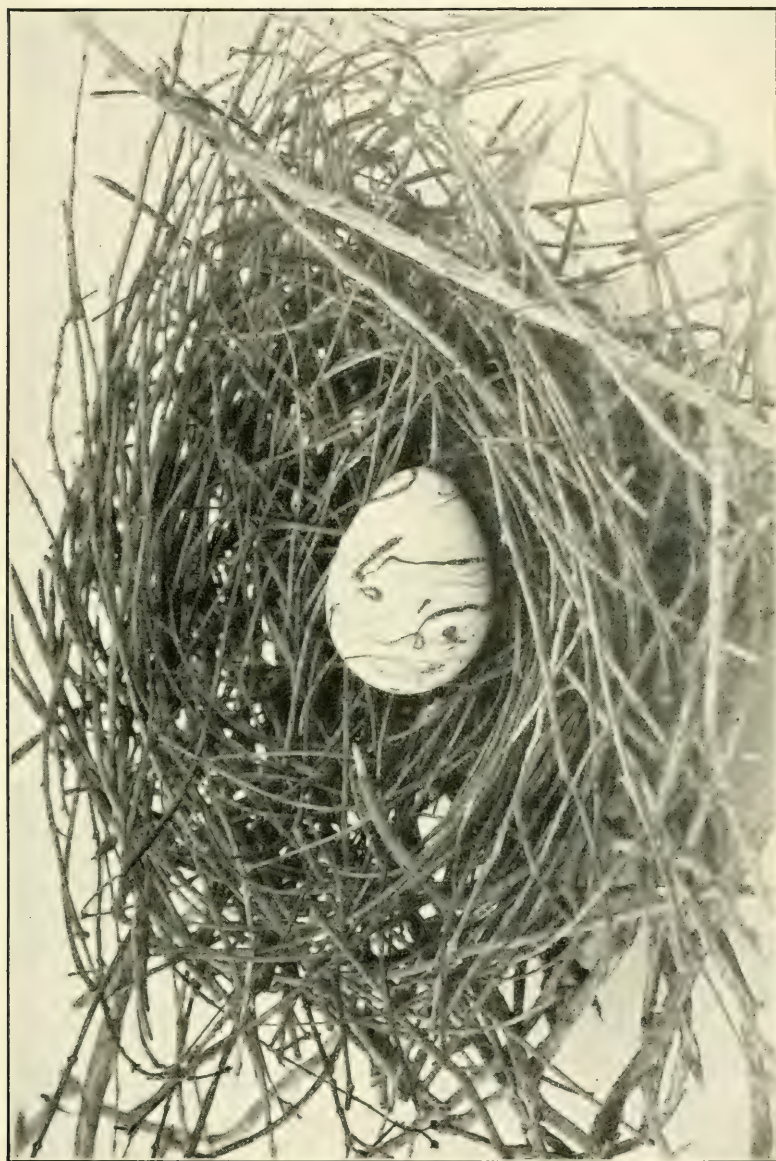
and most sheltered end of the passage, while at the western and more exposed end not nearly so many were placed. Other articles of decoration placed outside the ends of the passage included berries, needle-wood tree (*Hakea leucoptera*, R. Br.) seed-pods, cypress pine (*Callitris robusta*, R. Br.) seed-pods, Emu tree (*Eremophila longifolia*, F. v. M.) berries, grue or Emu-apple (*Owenia acidula*, F. v. M.) seed-balls, glass, bleached forest land-shells (snails'). Of the latter there were six in all, including two species new to science,* one flat species measuring over an inch across. In the passage the following articles were displayed, viz. :—Two very bleached land-shells (snails'), two pieces of old tea-lead which had gone white with exposure to the weather, few small white bones, and one piece of Emu egg-shell bleached pure white, and measuring $1\frac{3}{4}$ by $\frac{3}{4}$ inches. The grass walls of this bower were very upright, as is the case with the others found here, and do not incline inwards very much at the tops. The walls were beautifully built of dead stems of the blue-grass (*Andropogon sericeus*, R. Br.) All the Bower-Birds here so far appear to use this kind of grass for bower-building. A belah tree that contained a new nest of the Striped Honey-eater (*Plectorhampus lanceolatus*) ready for eggs a week ago, was visited, but it had been pulled to pieces. Here I saw seven Grey Struthideas in determined fashion hunt a Pied Grallina from the nest on which it was sitting, and pull it about, throwing the eggs out. Probably these birds ransack many nests of other birds as well. Bush-fires about again, and smoke everywhere.

15th October.—Two Bower-Birds were about the camp at 5.15 this morning, and, in company with four Grey Struthideas, were feeding close by when I was breakfasting. The Bower-Birds flew up into the wilga tree over my tent, and imitated the calls of Brown Hawks, Whistling Eagles, Magpies, Black-throated Butcher-Birds, Sordid Wood-Swallows, Grey Struthideas, and the mew of a domestic cat; the latter cry is very cleverly given, and nearly all the Bower-Birds here render it. Visited No. 2 bower, under the boobialla tree, a few miles north of camp, and found it in good order; two Bower-Birds flew up from it into a dead tree. Some hours were spent watching the birds playing in the bower and flying into trees close by. The birds show no sign of breeding yet, as far as I have been able to observe. This bower is beside a dried-up warrambool or bog-hole, and numerous green coolibah and prettily-shaped budda trees (*Eremophila mitchelli*, F. v. M.) grew round about. Goannas (*Hydrosaurus*, sp.) plentiful, some of great size. Saw several Emus and a pair of Native Companions. White Cockatoos (*Cacatua galerita*, Lath.) seem to confine themselves to the large eucalyptus trees along the Moonie River. Saw a flock of 9 or 10 White-browed Babblers (*Pomatostomus superciliosus*) in the native lime trees on the edge of the plain east of my camp. They appear to like the open plains better than parts where the timber is large and close. They are not noisy like the other (larger) species.

16th October.—Explored the country to the east, and also visited No. 3 bower, and found that cattle had been eating the leaves off the low, drooping limbs over same, so I built a rough fence with dead trees around the wilga under which the play-ground was built. Two Bower-Birds flew up from the play-ground as I approached, and articles in same had all been re-arranged since my last visit. All

* I succeeded in also finding living ones in the forest.—S.W.J.

was in good order. Additions to decorations were—a tooth like that of a cow, part of very old zinc frame of small mouth organ, and glass. The birds flew several times due south, and kept going into the trees about 100 yards south from the bower. I watched for a long time, but got no clue to show that they had a nest or were building one. Found the nest of a Butcher-Bird (*Cracticus destructor*) in a green cypress pine, containing three eggs. Found nests of *Struthidea cinerea*, *Myzantha garrula*, and *Pomatostomus temporalis*, containing young. Noticed bumble trees (*Capparis mitchelli*, Lindl.) smashed down in many places by the hungry cattle. Saw several fox-burrows on the sand-ridges. Came across Singing Honey-eater (*Ptilotis sonora*) feeding young, and Black-faced Cuckoo-Shrike (*Coracina robusta*) sitting on her nest at the end of a long horizontal limb of a coolibah. Found a somewhat fresh nest (probably of 1910) of Bower-Bird, placed 20 feet up in a green leopard-wood tree (*Flindersia maculosa*, F. v. M.) on the edge of a large plain. Found another old nest of the Bower-Bird in a small green cypress pine (*Callitris robusta*, R. Br.), built 21 feet up from the ground. The tree stood about 130 yards south of an equally old bower. This nest and the other old ones of this species found to date by me here are prototypes of the one which Mr. Bruce Doyle kindly gave me here, and from which he had taken eggs on this station on the 20th December, 1910. (*Vide* Plate IX.) His nest contained two handsome eggs—one, unfortunately, got broken owing to a strong gust of wind coming while he had his hand in the nest. The tree stood about 3 miles due west of my camp, and close by was a sand-ridge covered with a network of rabbit-burrows, and many poisoned bunnies were lying about. The nests are easily recognized when closely examined, being perfectly distinct from any other nests about these parts. I find the outside of the nest is generally constructed of dead sticks and twigs of the budda trees (*Eremophila mitchelli*, Benth.), and sometimes those of dead pines (*Callitris robusta*, R. Br.) The lining is of much smaller sticks and twigs, and the dead and slightly curved twigs of the cunnyanna trees (*Ventilago viminalis*, Hook.) and boobialla (*Myoporum acuminatum*, R. Br.) are mostly used. Visited No. 3 bower again, and watched the birds for over three hours, but got no clue of a nest. Found nest of Black-throated Butcher-Bird (*Cracticus nigrigularis*) containing three young, and a new nest of *Pseudogerygone jacksoni*, pulled to pieces and suspended from the suckers of a ring-barked coolibah. Pied Robins (*Petræca picata*) were plentiful; shot pair for identification. Observed nest of Black-and-White Fantail (*Rhipidura tricolor*) with eggs. Another new nest of *Plectorhamphus lanceolatus* found pulled to pieces and hanging in shreds. Saw Whistling Eagle's (*Haliastur sphenurus*) nest in tall green coolibah, placed up over 70 feet. Noted many nests to-day of different species all pulled to pieces. Found new nest of Crested Bell-Bird (*Oreoica*) in a green wilga (*Geijera parviflora*, Lindl.), well hidden and protected by a mass of the thorny nypang vines (*Capparis lasiantha*, R. Br.), showing sweet-smelling flowers. Noted nest of Rose-breasted Cockatoo (*Cacatua roseicapilla*) in green and leaning trunk of a coolibah; beneath the hollow the birds had eaten all the bark off the tree on the top side for fully 3 feet down, thus leaving the hard, smooth trunk underneath. I have noticed several like this, and probably it is done with the view of preventing goannas, &c., from climbing to the nest. Found some skins of half-lemons to-day in the bush, which the Bower-Birds evidently carried fully



Nest and Egg of Spotted Bower-Bird (*Chlamydodera maculata*).

half a mile. I saw the birds at different times leaving camp with them a few days ago. A mirage on the plains is very remarkable.

17th October.—Saw few Red-kneed Dottrel (*Erythrogonys cinctus*) at clay tank beside camp. Watched the Bower-Birds at No. 2 bower, north of camp, nearly all day, and examined a great many more trees, but no sign of a nest.

18th October.—Walked some 4 miles north-west of camp to-day. Took nest and eggs (two) of *Pseudogerygone jacksoni*. Visited No. 4 bower, under the wild red currant bush (*Exocarpus aphylla*, R. Br.), and the two Bower-Birds flew up from it. I watched them visit the pines near, and bring green seed-pods from them to the play-ground. More bones, bleached land-shells (*Helix*), &c., added to this bower since my last visit. Being curious to know where the Bower-Birds belonging to No. 4 bower collected the land-shells for their play-grounds, I set to work on a dried-up warrambool not far away, and on removing the loose pieces of fallen bark at the base of some dead belah trees found a number of bleached shells (*Helix*), and, moving some fallen trees, raked and dug down into the sheltered root-holes of the dried mud bed, and found several living specimens, two species of which are new to science. They will be described by Mr. C. Hedley, F.L.S., Conchologist and Assistant Curator of the Australian Museum, Sydney. Another instance of the play-ground of a Bower-Bird leading up to the discovery of other new land-shells may now be quoted respecting the rare, beautiful, and remarkable shells known as *Panda whitei*, Hedley, named in compliment to Mr. H. L. White, and described and figured by Mr C. Hedley, F.L.S., in the *Proceedings of the Linnean Society of N.S.W.* (1912, part 2). These were discovered by me in the Pioneer River district, North Queensland, in 1908, owing to my finding broken shells in a play-ground of the Satin Bower-Bird (*Ptilonorhynchus violaceus*). In an adjacent dense scrub I found several living shells.

To-day I noticed two eurah trees (*Eremophila bignoniiflora*, F. v. M.), bearing pink blossoms instead of yellowish-cream, and collected specimens. Spiny-cheeked Honey-eaters (*Acanthogenys ruficularis*) were feeding freely from the large bell-like blossoms of these trees. Visited No. 2 bower, and found the birds were there. Saw a large Black Cormorant (*Phalacrocorax carbo*) at the sheep-tank near the camp. It was busy capturing crayfish (*Cheraps bicarinatus*), eating them on the bank. Several Emus came up close to the camp just before dark.

19th October.—“Willie willies” (whirlwinds) plentiful to-day. On two occasions lately one has passed over No. 1 bower near camp and wrecked it badly, but the birds repaired and rebuilt it each time. Nine Emus in front of camp at 6 a.m. Budda wood when burning smells like tar, causing a pleasant aroma. Saw a flock of 11 *Corcorax melanorhamphus*. Found nest of Bichenov Finch (*Stictoptera bichenovii*) containing four eggs. Saw a pair of birds resembling *Eopsaltria australis* to-day; they were feeding and flying about the sides of trees where the timber was dense. Their throats were of a dark yellow, and much deeper than the breast; eyes black. Examined them carefully at close range with the field-glasses. Saw one feeding the other. Both appeared to be adult birds. Came across swarm of English bees hanging in a clump from the branch of a dead budda tree; the bees flew at the coloured handkerchief around my neck.

Found more huge but empty mud nests of *Corcorax*. Took another nest and clutch of two eggs of *Pseudogerygone jacksoni*; eggs slightly incubated. The nest was in coolibah sucker 5 feet up from the ground. Took set of three eggs of Grey Struthidea. Barcoo flies very troublesome.

20th October.—Visited No. 3 bower. Additions to decorations were three bleached specimens of a large brown beetle (*Psolidura squamifera*), also a large, handsome dead one belonging to the *Buprestidæ* family; also a bent galvanized roofing screw and clout-headed galvanized nail, also one large green cigar-shaped pod of the native silk-pod vine (*Marsdenia leichhardtiana*, F. v. M.) One bird flew from the bower into a dead coolibah. Found three nests of *Struthidea cinerea*; all contained young. Visited the nest of Bower-Bird in a flowering leopard-wood tree found on 16th October, and took limb and nest all complete. The nest appears to be about a season old, and is in splendid condition. Leaving my water-bag standing on the ground to-day while I was climbing a tree, a Bower-Bird flew down and picked at the stone neck; it may have been after a drink, or wanted the stone ring (like the neck of a bottle) for its play-ground. Another old nest of the Bower-Bird was observed, placed 16 feet up in a small white-wood sapling (*Atalaya hemiglaucæ*, F. v. M.) Several "willie willies" swept by very strongly to-day, making a peculiar "whirr" as they travelled. Visited new nest of *Pseudogerygone jacksoni*, and found it pulled to pieces. The foliage of leopard trees, when full grown, is often pendulous and willow-like. The bark on the older trees is beautifully mottled, hence the name. Saw a pair of Cockatoo-Parakeets (*Calopsittacus novæ-hollandiæ*) the first observed here. Noticed a weed plentiful on the sand-ridges, or, properly speaking, sand-beds, as they only rise a few feet above the surrounding country. It is known as wild spinach (*Tetragonia expansa*, Murr.); the Bower-Birds very often have the hard, spiky seeds of it displayed in their play-grounds. Old residents tell me that when boiled the leaves of this creeper are good eating. Found nest of Noisy Miner (*Myzantha garrula*) in a green iron-wood (*Acacia excelsa*, Benth.); clutch, three eggs. Much sheep's wool was used in the construction of the nest.

21st October.—Tramped much country, but saw no more Bower-Birds or other new bowers. Passed No. 3 bower, and the additions to decorations were two brass buttons and another dead specimen of *Psolidura squamifera*, ♂. The cattle have been feeding about this bower again, and have walked on the edge of it, actually eating some of the dead grass forming the walls. They had knocked down my hurriedly put up fence. Red-capped Robins (*Petræca goodenovii*) plentiful now. Saw nest of Black-throated Butcher-Bird (*Cracticus nigrigularis*) with bird sitting, and placed in a beef-wood (*Grevillea striata*, R. Br.) Saw Crows (*Corvus coronoides*) feeding young on the ground. Friar-Birds and Yellow-throated Friar-Birds (*Tropidorhynchus corniculatus* and *Philemon citreogularis*) in evidence. Bees plentiful on small flowers of broom trees (*Apophyllum anomalum*, F. v. M.) The cunnya trees (*Ventilago viminalis*, Hook.) are in flower, and covered with red beef-ants (*Iridomyrmex detectus*). Noticed Struthideas again eating these ants. The flowers of this tree have a very offensive smell. Watched Bower-Birds at the various play-grounds to-day, and saw one of them feeding on the small pink berries growing on the boobialla (*Myoporum acuminatum*, R. Br.)

bushes. I tried to follow the bird, but was unable to do so, as it dodged me in the thick timber. No. 2 bower is built under one of these bushes. In No. 3 bower one of the birds was busy fixing the grass upright again and adding more, thus endeavouring to repair the damage done by the cattle. I had it under observation for three-quarters of an hour, and it was busy all the time.

Again very hot, causing all the birds to go about with their mouths open. Heat unbearable at 4.30 p.m. Mice troublesome. Have now caught 27 in my camp; the bush is full of them. Watched the two Bower-Birds at No. 1 bower, but they still show no signs of breeding. They have added a lot more material to the decorations of this playground, including lead capsule from pickle bottle and a few round tin discs from preserved meat tins; these were collected from about my camp, and were fresh and bright.

22nd October.—The Bower-Birds' notes roused me at 5.10 a.m., and the birds were about my camp again, mimicking various sounds, including the notes of Whistling Eagle, Brown Hawk, Struthidea, Magpie, Grallina, &c., also the peculiar noise before referred to, very much resembling the sound produced by sheep and Emus rushing through wires of a fence; also a noise resembling sheep walking through small dead fallen branches. A great deal of the mimicry by these birds is carried on at early morning.

Noticed many butterflies about lately, the white and brown *Belenoistentonia fabricius*, and collected specimens.

23rd October.—Bower-Birds about camp again early this morning. I found a beautiful nest of the Lanceolate Honey-eater suspended from the end of a drooping limb of a green coolibah (*Eucalyptus bicolor*, F. v. M.) In the same tree was a nest of a Crested Pigeon (*Ocyphaps lophotes*), with bird sitting. Both nests contained eggs. Also found the nest of a Crested Bell-Bird (*Oreoica*) in a leopard tree, 9 feet up. Noted nest of Magpie (*Gymnorhina tibicen*) in a white-wood, with the bird sitting. Saw Butcher-Bird (*Cracticus destructor*) swooping at a goanna which had attempted to retreat into the hollow spout of a dead tree. Close by the nest of this bird was observed, containing only two eggs. I think all the birds have to fight their own battles frequently with these goannas, and no doubt many nests are robbed of eggs and young by the reptiles. On the other hand, they are useful in destroying many young rabbits. Found two new nests of the Yellow-throated Friar-Bird, and saw Orioles (*Oriolus sagittarius*), Black-faced Cuckoo-Shrikes, Spiny-cheeked Honey-eaters, Lanceolate Honey-eaters, &c., in a clump of green belahs. Saw another nest of the Whistling Eagle placed high up in a blood-wood (*Eucalyptus terminalis*, F. v. M.) Found nest of fresh appearance of Spotted Bower-Bird placed up 20 feet in the top of a green budda tree (*Eremophila mitchelli*, Benth.) The nest is a fine specimen. The surroundings at this part were quite barren, without a blade of grass, and all had a very arid and drought-stricken appearance; yet this is the kind of place these interesting birds love to dwell in.

Moving on eastwards, I walked over a vast area of sand, the heat of which could be plainly felt through my thick boots. At this part a Bower-Bird flew up from a clump of long, stiff grass (*Xerotes leucocephala*, R. Br.) growing in the hot sand and bearing large round balls or seed-pods by the ends of thin stalks—they were nearly as large as walnuts. Some had two pods on a stem. I never saw the grass before. Very hot, and Barcoo flies most troublesome. Saw several

handsome Crimson-winged Lories (*Ptilinopus erythropterus*) feeding in cypress pines (*Callitris robusta*, R. Br.), in company with Barnard Parrakeets. The mistletoe (*Loranthus quandang*, Lindl.) on the leopard-woods is now out in yellow blossoms, and a number of Honey-eaters visit them.

24th October.—Shot a Raven (*Corone australis*) in front of my camp early this morning. Yesterday a storm blew down many trees and branches, as well as nests, but the camp stood well. Leopard-woods all well out in blossom now. Noticed a broom (*Apophyllum anomalum*, F. v. M.) covered with many chrysalides of a butterfly (*Belenoistentonia fabricius*). Saw new and neat dome-shaped nest of Short-billed Tit (*Smicromis brevirostris*) in top part of a green budda tree, and over it hung 11 of the long cigar-shaped pods of the native silk-vine, giving a very pretty effect. White-shouldered Caterpillar-eaters (*Lalage tricolor*) are becoming plentiful lately. Heard a Pallid Cuckoo (*Cuculus pallidus*) to-night, which is the first I have heard since I arrived here. Dollar or Roller-Birds (*Eurystomus pacificus*) were about to-day. Large bush-fires raging near.

25th October.—The clay tank or dam where I get my water, near the camp, is going down rapidly; Strong wind from north-west. Collected nardoo weed (*Marsilea drummondii*, A. Br.) and seeds in a dried-up warrambool. The Emus eat the leaves and seeds of this plant. Saw no Bower-Birds about in the bush to-day. Great clouds of dust pass over the camp as the large flocks of sheep pass by to the clay tank to drink.

26th October.—Everything is in a very parched state, and the outlook is more serious than ever for the grazier and farmer. The land has a drought-stricken appearance throughout, and bush-fires are raging. Several Emus drinking at the clay tank this morning. Visited No. 4 bower, and found all in good order, more bleached land-shells having been added to the decorations. Crested Pigeons plentiful. Found new nests of Lanceolate Honey-eater, also a huge nest of the Wedge-tailed Eagle (*Uroaetus audax*), placed in a slightly leaning and unusually large dead cypress pine. The nest was located at a height of 50 feet, and a well-feathered young bird was sitting on the side of the great structure. The nest measured 6 feet across. Collected nest and two eggs of Barred-shouldered Dove (*Geopelia humeralis*) from a green wilga; birds not common. A beautiful lilac everlasting flower is now plentiful on the open plains; it is known as *Ptilotus exaltatus* (Nees.), and resembles somewhat the colour of the nape of the Bower-Birds. Came across some specimens of the White-face (*Aphelocephala leucopsis*). Saw Doves (*Geopelia placida* and *G. cuneata*) in dead cypress pines. Saw silver-leaved iron-barks (*Eucalyptus melanophloia*, F. v. M.) fully 90 feet high and 3 feet in diameter at base; also noted the carbeen or Moreton Bay ash (*Eucalyptus tessellaris*, F. v. M.), and blood-woods (*Eucalyptus terminalis*, F. v. M.) of great size, and in these the Wedge-tailed and Whistling Eagles frequently build their large nests. Saw Rufous-breasted Thickheads (*Pachycephala rufiventris*). Several large kangaroos were licking their arms or forelegs from the elbows downwards, the saliva dropping from their mouths. No water was near, and the heat intense. Walked a long way to-day. Saw several of the Little Wood-Swallows (*Artamus minor*), and their brown backs shone beautifully in the sun. The white-woods (*Atalaya hemiglaucula*, F. v. M.) are now out in large

clusters of white blossoms, appearing very pretty indeed. The flowers are not unlike small orange-blossoms. Found nest and eggs of Brown Flycatcher (*Micræca fascians*), and new nest of Pied Robin (*Petræca picata*).

27th October.—Large flocks of White-bellied Wood-Swallows (*Artamus hypoleucus*) seen. A pair of Wood-Ducks (*Chenonetta jubata*) flew into a coolibah. In every instance when I saw a Bower-Bird carrying a twig it took it to the play-ground and placed it in the foundations or in the sides or walls of same. Found nest of Wedge-tailed Eagle, containing two Eaglets, in a dead coolibah. Green cypress pines look very pretty and graceful on some of the sandy parts. Nest of Rose-breasted Cockatoo in a blood-wood. Saw some Native Companions (*Antigone australasiana*) in company with sheep near a dried-up bog-hole or warrambool. Found nest of *Pardalotus ornatus* in hollow of dead coolibah, and bird sitting.

28th October.—Two Bower-Birds about camp early this morning, carrying on some wonderful mimicry. One bird chased the other as they were feeding in front of camp, and each time that one advanced towards the other it ruffled its feathers and erected its lilac nape-feathers fan fashion. The frill was opened and closed rapidly and was beautiful as the sun shone upon it, and whilst thus displaying it the bird moved its head up and down. Leaving the camp, they flew up into a dead coolibah, and continued chasing one another. I never saw them making this display so freely and continuously as this. Probably it is an indication of the breeding season approaching. Saw Chestnut-eared Finches (*Tæniopygia castanotis*) engaged in nest-building. Found new nest of Crested Bell-Bird. Noticed number of Emus feeding on plain west of camp. Took nest and two eggs of *Pseudogerygone jacksoni*; eggs slightly incubated. Saw tree bearing galls (not fruits); these are often collected by the Bower-Birds and placed in their play-grounds; the tree, when cut, has a salmon-coloured bark, and is known as *Santalum lanceolatum*, R. Br. The mirage across the plains to-day was very pronounced. Noticed many more glass stoppers added to the decorations in No. 1 bower, also some small coloured stones, &c. Both birds engaged.

29th October.—Crows and Ravens numerous. Visited No. 4 bower, north of camp, but birds were absent, and 250 yards south-west of this play-ground found a Bower-Bird busy building the foundation of a nest in the top of a green budda tree (*Eremophila mitchelli*, Benth.) I retreated at once, delighted. A boobialla tree (*Myoporum acuminatum*, R. Br.), bearing the favourite berry of these birds, stood close by.

30th October.—Came across nest, of new appearance, of Bower-Bird, built in a clump of mistletoe (*Loranthus linearifolius*, Hook.) in the top part of a beef-wood (*Grevillea striata*, R. Br.), and placed up 24 feet. Took nest (three eggs) of Yellow-throated Friar-Bird. Very red sunset to-night.

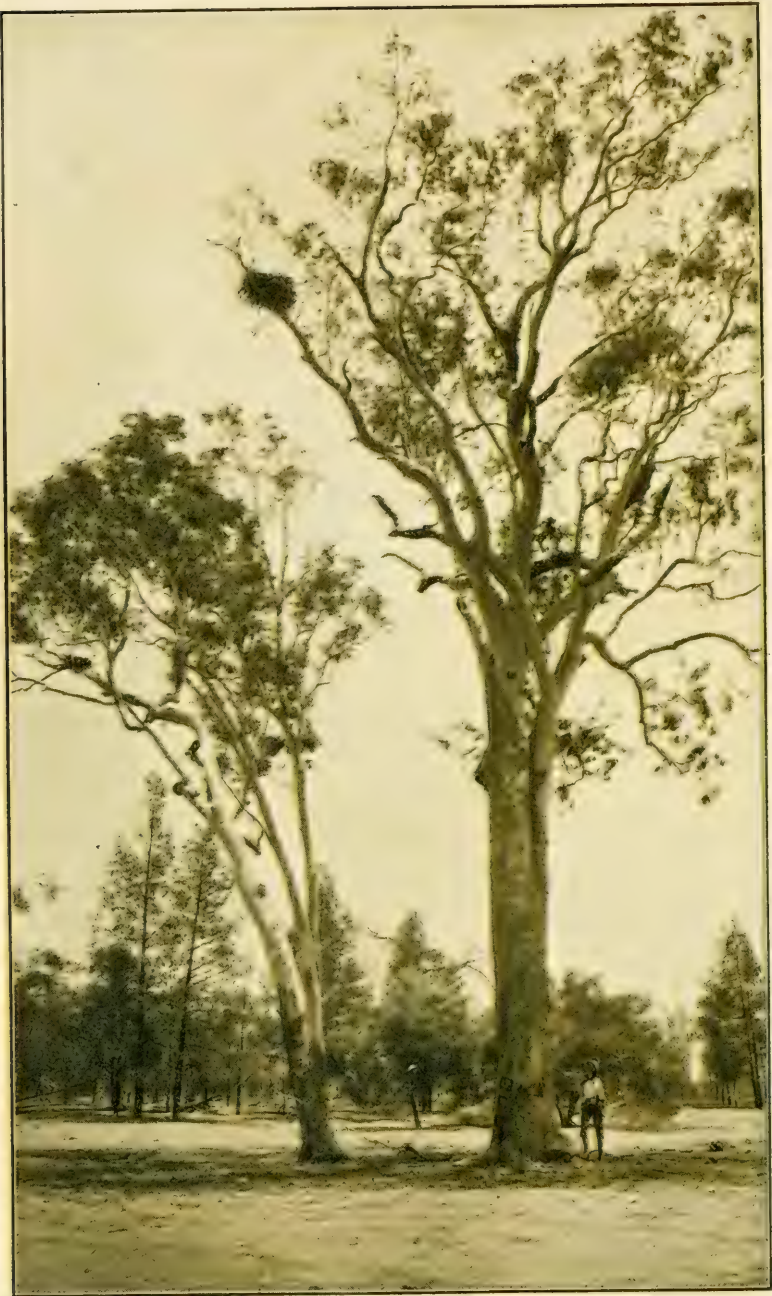
31st October.—Strong wind blowing again, which renders it difficult to cook food or to hear the notes of the birds. Mr. Bruce Doyle called early. I walked out and showed him some of the fresher-looking Bower-Birds' nests which I had under observation. Saw Bower-Bird again feeding on the pink berries of a boobialla, and later another bird joined in the feast. Probably these birds breed when this small fruit is ripe. Found a perfect nest of a Bower-Bird, though

very like a last season's, in a small green cypress pine in a barren and sandy place. It was placed about 12 feet up, well exposed, and built on two small horizontal limbs, against the thin trunk of the tree. Another old one was found close by in a green pine at a height of 21 feet, and built in same position. Found another old one in green pine, position same, height 22 feet. Probably these were all built by same pair of birds, as they are not far from one another, and their situations and trees are similar. An old bower was not far away. Saw another huge nest of Wedge-tailed Eagle, with young bird calling out. Found nest of Crested Pigeon containing two eggs. Passed several skeletons of Emus to-day. Saw and heard a Harmonious Thrush, which is rare. Numbers of Masked Wood-Swallows (*Artamus personatus*) about. Black-faced Cuckoo-Shrikes plentiful.

1st November.—Little rain last night. All the Lanceolate Honey-eaters here use Emu feathers in the construction of their handsome nests. Saw Grey Struthideas seriously sitting on old, empty nests to-day; they often give me a climb for nothing. Nest and two eggs of Pied Robin taken. Found old nest of Spotted Bower-Bird, placed 13 feet up in a green wilga (*Geijera parviflora*). Took nest and pair of eggs of Red-capped Robin.

2nd November.—Found old Bower-Bird's nest placed at a height of 21 feet in a budda tree a fair distance north-west of camp. I notice the Crested Pigeons often build and hide their flat to saucer-shaped stick nests in the green nypang vines.

3rd November.—Walked south-east of camp, and found another new play-ground (No. 5) of the Bower-Bird. It was built under a native red currant bush (*Exocarpus aphylla*, R. Br.), and the bird was hunted from it. Walls constructed, as usual, of dry stems of the blue-grass (*Andropogon sericeus*, R. Br.) Decorations—glass, small bones, green seed-cones from cypress pines, fresh green twigs of salt-bush (*Enchylana tomentosa*, R. Br.), small piece of folded newspaper (*Sydney Morning Herald*), green nypang pod, galvanized roofing screw, few small stones, &c. About this bower and on a log beside it were fresh droppings from these birds, which contained numerous remains of the pink berries of the boobialla trees. Saw a Mistletoe-Bird (*Dicaeum hirundinaceum*) feeding on the ripe berries of a mistletoe (*Loranthus linearifolius*, Hook.) which was growing on a green budda tree. Found nests of native bees (*Trigona carbonaria*) in coolibahs, and another old nest of Bower-Bird placed up 17 feet in a dead budda. Saw flock of four Crimson-bellied Parrakeets (*Psephotus hæmatorrhous*). Another old nest of Bower-Bird in green budda tree, and placed up 22 feet. Walked on until I struck the boundary fence of Cambo Cambo and Goondoobluie stations. At this part the country opens into a big plain, with few trees. Flushed an Owlet-Nightjar from a hollow, but saw no eggs. Here saw very large fruit on bumble or wild orange trees (*Capparis mitchelli*, Lindl.), some of which were 8 inches in circumference. The fruit consists of a mass of seeds; when ripe the Bower-Birds eat the soft parts; the flower is large, having four yellowish petals, with a cream-coloured tassel from the centre. Fruit when ripe has a delicious aroma; if it is broken open when green it resembles a pomegranate inside, and the seeds at that stage are fleshy and pink, and are embedded in a hard, yellowish pulp. Noticed that one note uttered by the Corcorax to-day sometimes closely resembles the guttural "Kar-r-r-r" which



Nests of Wedge-tailed Eagle (*Uroaëstus audax*) in Carbeen (Eucalypt) trees.
Old nest in smaller tree.

is the common note of the Spotted Bower-Bird. Saw an Emu get through a six-wire fence with great ease and rapidity.

4th November.—Built small framework of saplings to cover with blankets at night, and inside develop my photographic plates. Met Mr. Bruce Doyle in the bush, and in company with him took a nest (two eggs) of Pied Robin, which was built in a small green budda tree. Saw some handsome Ground Cuckoo-Shrikes (*Pteropodocys phasianella*). Their peculiar note is shrill, and quite distinct from that of the other Cuckoo-Shrikes. Nest of Black-and-White Fantail in tree near camp now contains three young birds, which fill the nest well. They can nearly fly. Foxes plentiful. Occasionally I came across the small flowers of *Helipterum floribundum* (Dl.) and *Cassia circinata* (Benth.) in the Bower-Birds' play-grounds.

5th November.—Two Bower-Birds about the camp early this morning, picking up objects and flying away with them to their bower (No. 1). While hopping about and chasing one another the erection of the beautiful lilac frills was again very noticeable, the "fan" opening and closing often rather quickly, the feathers on the head being ruffled at the same time. Saw two Brown Hawks (*Hieracidea orientalis*) calling out loudly and swooping down at a large scaly lizard (*Trachysaurus rugosus*). I often find the remains of these peculiar and slothful blue-tongued reptiles on the ground under the numerous Hawk and Eagle nests.

6th November.—Visited nest of Bower-Bird to the north-west of camp, which was seen in course of construction on 29th October, but to my surprise no more had been done to it, and the birds had evidently abandoned it. Found another Bower-Bird's nest in a budda sapling, only 8 feet up. Took nest and two eggs of Spiny-cheeked Honey-eater, nest placed near the top of a tall green belah tree; eggs fresh. Bird almost let me put my hand on her before flushing. Bower-Birds busy feeding on boobialla and wilga berries. Took some photographs with my large camera. After 7.30 p.m. developed and washed photographic plates exposed to-day. The heat was intense.

7th November.—Took some photographs of nests along the Moonie River some few miles east of camp. Saw pair of Bronze-wing Pigeons (*Phaps chalcoptera*) feeding on the ground. Also found old nest of Bower-Bird in clump of yellow-flowering mistletoe (*Loranthus quandang*, Lindl.) growing in a tall leopard-wood; nest 30 feet up. Another in top part of a leopard-wood, 21 feet up. Took nests and eggs of Lanceolate Honey-eater.

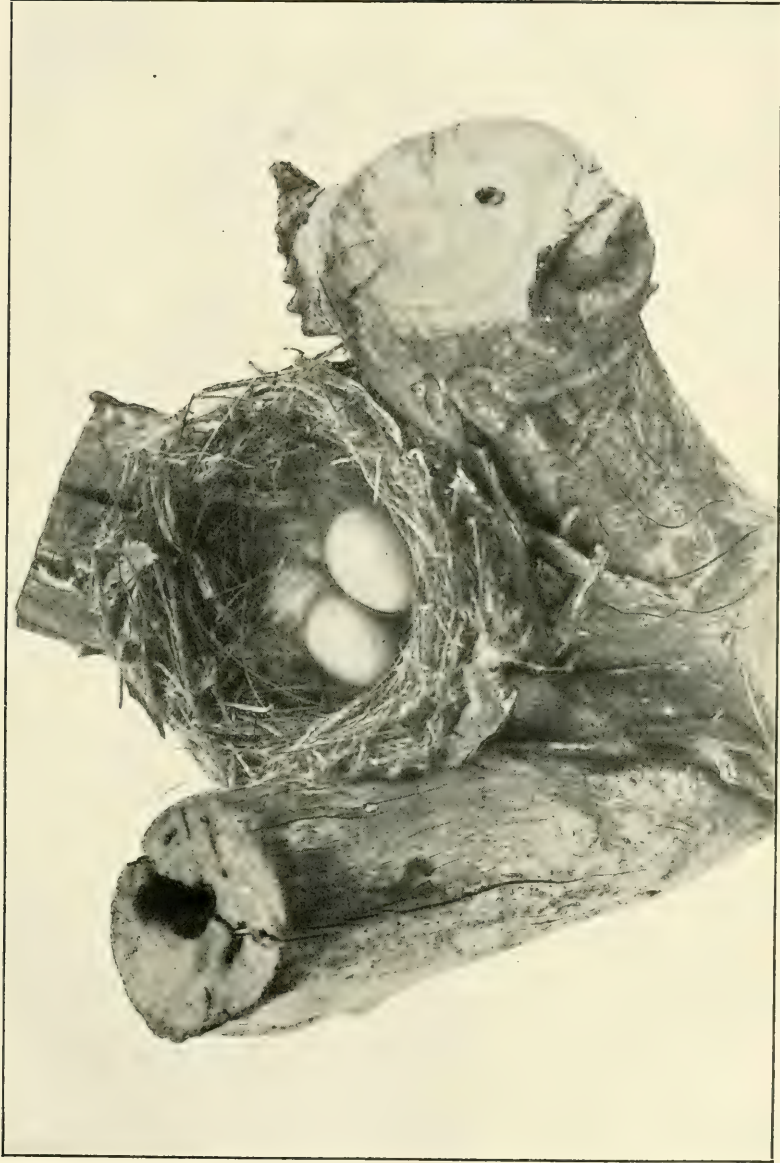
8th November.—Found the nest of a Wedge-tailed Eagle in a huge "carbeen" tree, or Moreton Bay ash (*Eucalyptus tessellaris*, F. v. M.) on a sand patch. Young Eagle in nest. (Plate X.) Nest about 60 feet up, an immense structure. Beautiful Crimson-winged Lories (*Ptilistes erythropterus*) perched quietly feeding on the seeds in the curled pods of a wattle (*Acacia longifolia*, Willd.), and were not at all disturbed by me walking past them. Visited No. 2 bower, under the boobialla tree; two birds playing in it. Additions to decorations included a few small clippings of galvanized iron, which probably were collected about the new house at the station homestead. This boobialla was in fruit, and the Bower-Birds now and then hopped up from their bower and began to feed. In a dried-up bog-hole (or warrambool) beside this bower there were some dead fresh-water shells (*Physa*), and a few fresh-water crabs closely resembling the

small rock-crabs on our sea-coast. They were dead and well bleached, and from description somewhat resemble a land species known as *Geotelphusa leichhardtii*. Mr. A. R. M'Culloch, of the Australian Museum, Sydney, informs me that they are very rare, and may yet turn out to be new. The back or top portion of one of these crabs I found in one of the Bower-Birds' play-grounds. Saw one of the Bower-Birds carry a dry, open pod of a needle-wood from this bower (No. 2) and throw it away. It was evidently tidying up house. Very hot; birds all going with bills agape. Found old nest of Bower-Bird in a green cypress pine, 18 feet up; a nest of Bichenov Finch was built on top of it. Found nest of Frogmouth (*Podargus strigoides*) in a coolibah; parent was sitting on a young one. Developed and washed more photo. plates to-night, and retired after midnight. The heat in the "dark room" (of blankets) was simply fearful. Water in clay tank beside camp is getting very low and dirty. Many sheep drink from it daily.

9th November.—Up at 4.30 a.m. and into the bush before the flies got bad. Later it was very hot, and the Barcoo flies furnished the usual pest. Noticed in front of camp to-day that when a Bower-Bird displays its beautiful lilac nape the bird sometimes opens and closes its wings rapidly, also moves its head up and down as it approaches its mate. Mr. Bruce Doyle advised me to shift camp if the water in the clay tank got much worse. My camp being central to my work, I shall not move if I can avoid it. I walked as far as the Moonie River, which was chiefly a succession of dirty water-holes. Here I saw Laughing Jackasses, Choughs, Dollar-Birds, Wood-Ducks (*Chenonetta jubata*), Bee-eaters, Blue-faced Honey-eaters, Yellow-throated Friar-Birds, White Cockatoos, &c. The river gums grow to a great size. Procured a Partridge Bronze-wing Pigeon (*Geophaps scripta*), a rare bird here. Noticed that the ripe bumble fruit has a flavour somewhat like the paw paw apple of Queensland. Found a tree (*Hakea fraseri*, R. Br.) growing with long round and wire-like stems or needle leaves without joints, some measuring over 15 inches. The Bower-Birds sometimes use a few of these wire-like leaves in the walls of their bowers. The tree was 20 feet high, and is the only one I have seen during my many miles of tramping about here. The long leaves or needles hang like the foliage of the weeping willow. The tree belongs to the *Proteaceae*.

10th November.—Up at 4.15 a.m. Bower-Birds calling and mimicking in front of the tent even at this early hour. Fruit starting to ripen on the native lime trees (*Atalantia glauca*, Hook.); it is delicious, and makes a splendid cooling drink. The White-browed Babblers (*Pomatostomus superciliosus*) frequently build their nests in these trees. Intense dry heat has cracked and badly warped my whole-plate camera and dark slides, the latter being almost useless. Developed more plates to-night, and retired after midnight, when a Black-and-White Fantail was calling in the tree over the tent.

11th November.—Up at daylight. Air thick with smoke from fires everywhere. Temperature in shade at 1 p.m. was 114 degrees, consequently birds all silent. Visited No. 5 bower, some miles south-east of camp, and found two birds there. Then walked 5 miles and visited No. 4 bower, but no birds present. In the passage-way were several freshly-plucked berries of the Emu tree (*Eremophila longifolia*, F. v. M.) "Willie willies" again.



Nest and Eggs of Pied Robin (*Petrarca picata*).



Nest and Eggs of Spotted Bower-Bird (*Chlamydodera maculata*).

FROM A PHOTO. BY S. W. JACKSON.

12th November.—Bower-Birds camp companions again at daylight, and mimicking every camp sound. Captured a very rare insect to-night, known as *Psychopsis*.

13th November.—Went to No. 5 bower; three birds were at it, but found no trace of nest anywhere. Saw flock of 49 Native Companions in a dry warrambool. Took nest and eggs (two) of Pied Robin from a dead wilga tree. (Plate XI.) It is wonderful to note the way in which the Bower-Birds can swallow lumps of sun-dried damper crusts.

FIRST BOWER-BIRD'S NEST.

14th November.—Saw five Ground Cuckoo-Shrikes on the ground under some coolibahs. The flight is rather Hawk-like, and when alighting on a limb they often topple about as if wounded. In a good-sized boobialla (*Myoporum acuminatum*, R. Br.), on the edge of a big plain, I found a new nest of the Spotted Bower-Bird containing two handsome eggs, perfectly fresh. (Plate XII.) The tree had been examined before, but there was no trace of a nest when last I was at this part. The nest was about 11 feet up, and well exposed. The Bower-Bird sat in a beef-wood (*Grevillea striata*, R. Br.) close by, and with little noise watched operations. Nest was the usual loose and rather shallow cup-shaped structure of dead sticks and twigs, lined inside with smaller sticks. The eggs could be seen through the nest from the ground. This nest appeared to have been very carelessly and hurriedly built, but the sticks were freshly broken at the ends, and included some dead prickly sticks (which were in the foundation) of the roly-poly weed (*Bassia*). The birds have built in a tree the berries of which (now ripe) form one of its principal foods. The nest belongs to the pair of Bower-Birds which have their play-ground (No. 1) close to my camp, and is situated about 400 yards directly north-west of their bower. Walking on, I saw a mob of 14 Emus on a plain towards the Goondooluie bore drain. Saw Friar-Birds (*Tropidorhynchus corniculatus*) attempting to capture small bright blue butterflies (*Ogyris hewitsoni*, Waterhouse). This insect appears rare here, and generally frequents the flowering mistletoe (*Loranthus quandang*, Lindl.) on the leopard-woods (*Flindersia maculosa*, F. v. M.) The latter trees are now beginning to bear their long, peculiar prickly pods. These the Bower-Birds collect and place in their play-grounds. Took clutch of five eggs of Raven (*Corone australis*); nest up 50 feet in a tall belah tree. Mirage, resembling water in the distance, again very pronounced on the plains.

15th November.—Up at 4 a.m. Plague of mice since yesterday. Many Spiny-cheeked and Lanceolate Honey-eaters feeding from the yellow blossoms of the mistletoe (*Loranthus quandang*, Lindl.) growing on leopard-wood and native lime trees. Visited No. 2 and No. 5 bowers. Bower-Birds scarce to-day, there being none even at the camp.

16th November.—The plague of mice has mysteriously vanished. White-woods (*Atalaya hemiglauca*, F. v. M.) now coming out into pretty clusters of winged seeds. Walked some miles; heat intense; not a single Bower-Bird seen. Saw some Emus whose condition was too poor for them to run; four fine red kangaroos were close to them. Emus mostly sitting in shade of trees, with bills apart. On returning to camp saw a Bower-Bird pick up the lead capsule from top of a pickle bottle and take it over to No. 1 bower. Obligated to have meals in the dark at night, owing to the myriads of pestering insects.

17th November.—Several Bower-Birds early this morning were busy picking holes into the damper cooked last night and left to cool on the rustic camp-table inside the front of the tent. Emus and other birds coming to the clay tank at camp lately in great numbers for water. It was 116 degrees in the shade to-day at 1 p.m. Walked some miles, and visited No. 5 bower, but no birds about. The passage-way had the following decorations added to it:—Seed-pods of pine, five green and perfect heart-shaped berries of *Pittosporum phillyroides* (Dl.), also dry berries of the curah tree (*Eremophila bignoniiflora*, F. v. M.) Saw much *débris* on the ground under a Wedge-tailed Eagle's nest, including numerous bones and skulls of rabbits and large lizards, also large ejected pellets of fur. Examined two Bower-Birds' old nests close together in a dead budda tree on edge of a plain, at which place most of them appear to build.

18th November until 2nd December.—Absent in Sydney, owing to family bereavement, my camp being left in charge of an assistant.

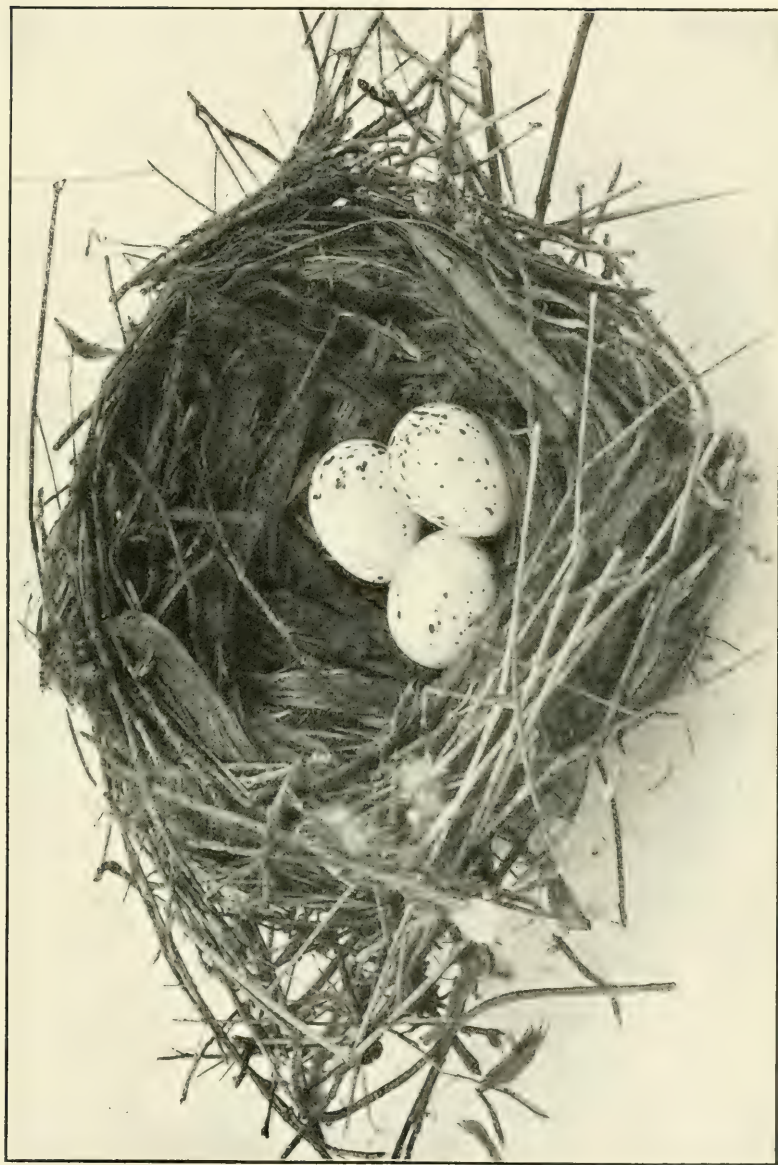
3rd December.—Returned from Sydney yesterday. Took nest and three eggs of Crested Bell-Bird in a green wilga tree, (Plate XIII.) Took peculiar brown pair of Magpie's eggs from a nest in a wilga. Found new nest of Ground Cuckoo-Shrike in a green coolibah, placed about 40 feet from the ground. Eggs two, and left for a set of three. The nest is much larger than those built by any of the other Cuckoo-Shrikes.

MORE BOWER-BIRDS' NESTS.

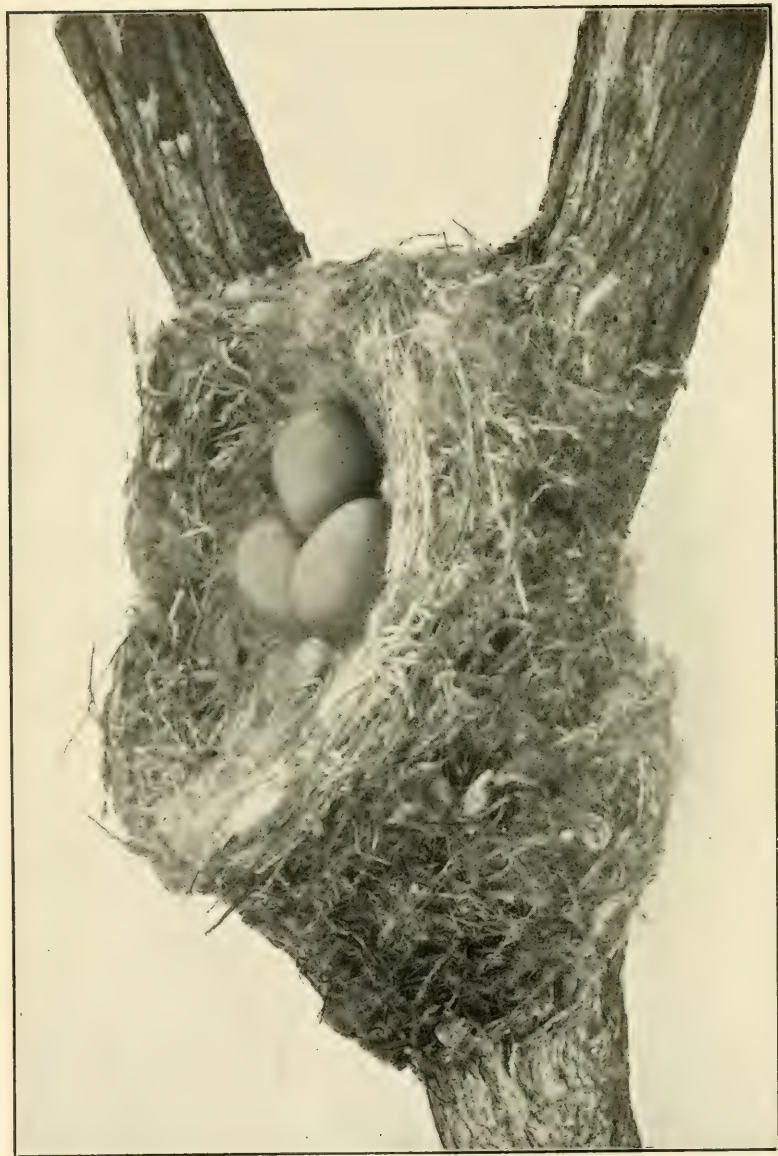
4th December.—Three Bower-Birds at camp at 5 a.m. Found perfectly new bower (No. 6) under a wilga, north-east of camp a few miles; walls and foundation composed entirely of dead stems of the blue-grass. The foundations of the bowers here are usually made of thin sticks, but the walls of the passage-way are always built almost entirely from the long, dead stems of the blue-grass. Decorations—pieces of bleached Emu egg-shell, tea lead, berries, &c.; not many articles placed in it yet. Took nest and eggs of Rufous Thick-head (*Pachycephala rufiventris*). Found six Bower-Birds' nests to-day (four old and two new), one being built in a bumble tree just 40 yards from the tree which contained the nest and two eggs on 14th November. The other new one is half-built, and in a wilga, north of camp; birds near. Some of the old nests of the Bower-Birds were built close to and under old ones of the Babbler (*Pomatostomus temporalis*). The water in clay tank at camp is getting very low, turning green, and full of insect life; must always be boiled before being used.

5th December.—Masked Wood-Swallows (*Artamus personatus*) breeding. Secured a pair of Pied Robins. Native limes (*Atalantia glauca*, Hook. f.) now laden with ripe fruit. Visited No. 3 bower, and found an old, weather-worn metal teaspoon amongst the added articles of decoration. Only one bird present. About 300 yards south-east of this bower a new nest was found containing one handsome egg. It was placed 25 feet up in a green cypress pine (*Callitris robusta*, R. Br.), and beside a Babbler's nest. Left it, in hope of getting two eggs. Saw a Magpie Goose (*Anseranas semipalmata*) fly over the clay tank at camp after sundown.

6th December.—Bunary trees (*Heterodendron oleafolium*, Df.) in flower. Took nest (three eggs) of *Philemon citreogularis*. Saw a Bower-Bird feeding on ripe bumble fruit. Took clutch of three eggs



Nest and Eggs of Crested Bell-Bird (*Oreocica cristata*).



Nest and Eggs of Ground Cuckoo-Shrike (*Pteropodocys phasianella*).

FROM A PHOTO. BY S. W. JACKSON.

of Harmonious Thrush. Visited nest of Ground Cuckoo-Shrike in the coolibah; difficult climb. It contained three handsome greenish eggs. Took limb and all. (Plate XIV.) Nest composed of small pieces of dead plants and twigs and all matted together with cobwebs and lined inside with rabbit-fur. Found nest of the Little Wood-Swallow (*Artamus minor*), containing three young ones, in the dead upright spout of a coolibah. There were a few small dead coolibah leaves laid on the bottom of the hollow which formed the nest. The birds flew close to my face as I climbed up. Nest 12 feet up. Visited No. 4 bower, under the native red currant bush, and a bird flew up from it into a dead coolibah. Found that many objects had been added to decorations, including 11 seed-pods of the leopard-wood and several more bleached bones from Emus' toes. Saw several more Little Wood-Swallows busily engaged feeding young in hollow limbs. Noticed several domestic cats gone wild about rabbit-burrows.

7th December.—Found Bee-eaters (*Merops ornatus*) nesting on sandy parts. Collected a billy-can full of native limes and crushed the fruit and bottled the juice, with sugar, in pickle bottles. The ripe fruit is about the size of a small nutmeg. Found another nest of Little Wood-Swallows containing three young. These birds must have started to lay here while I was in Sydney. Found beautiful nest of Orange-winged Tree-runner (*Neositta chrysoptera*) in a dead coolibah, containing one young bird. Crested Bell-Birds calling again in many places. Took clutch of two eggs of *Lalage tricolor*.

8th December.—Fruit on nypang vines starting to ripen, and Bower-Birds often feeding on it. Saw nest of Brown Flycatcher containing two eggs. Took nest and two eggs of Singing Honey-eater *Ptilotis sonora* from a broom (*Apophyllum anomalum*, F. v. M.). Saw more Restless Flycatchers (*Sisura inquieta*). Green shoots in the grass in some places since the recent showers. Crossed into Dumiendi station, on the east side of Cambo Cambo. Had a long and hot day's tramp.

9th December.—Visited the Bower-Bird's nest in the cypress pine east of camp and near No. 3 bower, which contained an egg on the 5th inst. Greatly disappointed to find nest empty. At the foot of the tree were goanna tracks on the bare, sandy ground. Visited No. 5 bower, and found therein 14 beautiful and perfect heart-shaped berries; other articles, including two galvanized roofing screws, had been added to the decorations, as well as a bleached claw of a freshwater crayfish and various seed-pods. Heat intense (116 in the shade at 2 p.m.), and could not walk far without resting. Saw a number of the long, oval, cigar-shaped pods in No. 1 bower, collected from vines (*Marsdenia leichhardtiana*, F. v. M.); many other objects had been added to the decorations, including more very old glass stoppers.

10th December.—Five Bower-Birds in front of camp early, and eating sun-dried pieces of damper. Being short of food, we cooked some Crested Pigeons (*Ocyphaps lophotes*) to-day, and found them excellent eating.

11th December.—Remained in camp to repair large camera and dark slides

12th December.—Sand-ridge honeysuckle (*Canthium oleifolium*, Hook.) in flower; the sweet-smelling blossoms attract the Spiny-cheeked Honey-eaters and others. Severe heat; hunted bats out of a great many trees. Birds all silent. The temperature rose to

118 degrees at 2.20 p.m. Wild Turkey (*Eupodotis australis*) on a plain. Strong wind to-day destroyed some of the bigger nests of various species, and disarranged some of the play-grounds of Bower-Birds.

13th December.—Bower-Bird in front of my tent at 4.10 a.m., and again imitating the sound of sheep or Emus getting through wire fence. The reproduction of the metallic sound is wonderful.

14th December.—Walked to Goondoobluie bore drain, passing over two big plains. Saw a Bower-Bird drink at this drain; followed it up to its bower (No. 7) under a native red currant bush (*Exocarpus aphylla*, R. Br.), and near a place where Chinese ring-barkers had been camped, as evidenced by the litter of various jars, cuttle-fish shells, old tins and boxes, rice bags, &c. The bower was small, and measured—length over all, 14 inches; width inside walls, 6 inches; height of grass walls, 10 inches. This play-ground, which was not decorated as neatly as the others found by me here, was just 76 yards (measured) from the bore drain, and ran east and west. Amongst the decorations of this bower were a few small pieces of the shell of the cuttle-fish (*Sepiidae*) of the sea, and I also found this in other bowers here, and at first was puzzled to know how the birds got hold of this marine object. However, later on I found several pieces of the shell about places where Chinese had once camped. I understand, on good authority, that they import the cuttle-fish in a preserved state for food purposes. About this part, and a few hundred yards from this play-ground (No. 7), no less than seven old nests of the Bower-Birds were observed, nearly all built in white-wood trees. The goannas must rob many nests, and the birds just move on and build again, hence the reason for so many old nests. Each pair of Bower-Birds seems to have its own particular kind of tree to build in, and the birds belonging to No. 7 bower have apparently selected the white-wood. The outside construction of one of the old nests consisted of the dry prickly sticks or stems of the roly-poly weed (*Bassia*). Altogether, 12 old nests of Bower-Birds were examined to-day, and notes taken. Saw many Emus on a plain. Drank water from the bore drain, which tasted as if baking soda had been put into it. Saw flock of 20 Corcorax. Found nest of Crested Bell-Bird containing two eggs, flushing bird off the nest. In the bottom of the nest were several brown, hairy caterpillars (living), about $1\frac{1}{2}$ inches long; I often saw these in the new nests of this bird, and no doubt they have some reason for putting them there.* After a long tramp, arrived back at camp at 7.30 p.m. To date I had not noticed more than three Bower-Birds at the same bower at one time.

15th December.—Many Crimson-winged Lories feeding on ripe seed-pods of the leopard-woods, the ground beneath being strewn with the broken pods. Visited nest of Bower-Bird in green wilga north of camp, which the birds had half-built on the 4th inst. To my surprise the nest was empty and the two beautiful eggs lying freshly broken on the ground underneath. We both saw a large goanna in another tree close by. This was another great disappointment; the nest belonged to the pair of birds at No. 4 bower, and was a large one, rather firmly built. It was the most compact of those taken here of this species. Both the birds were seen by us only about 60 yards away, and one of them was making a peculiar "Chucker-chucker-chucker"

* Same thing quoted in *Emu*, 1912, p. 37.—S. W. J.



Site of Nest of Spotted Bower-Bird in White-wood tree.

sound rapidly. This note, so far, I have only heard these birds make when they have a nest. The same applies to a note resembling "Kurra-kurra-kurra-kurra," quickly uttered.

16th December.—Owing to the heat there is a great difficulty in developing photographic plates, as the gelatine becomes soft, and sometimes melts, causing the whole picture to run off the glass, consequently some of the subjects had to be photographed again, which meant many more miles of walking. On Cambo Cambo station there is one part known as "Kundilla," where there are the remains of an old wooden house, which has been abandoned for upwards of 20 years. About such old and deserted places the Bower-Birds often collect glass and other objects for the decoration of their play-grounds;

17th December.—Five Bower-Birds were drinking water out of a dish at my camp early this morning. Visited the comfortable homestead at Goondoolblue station, 7 or 8 miles south-east of camp. Mr. Melville Doyle kindly drove me down. The manager, Mr. W. A. Murray, told me how destructive the Spotted Bower-Birds were on the fruit trees, and that many were shot there and at other places on that account. These birds are also very fond of the pink berries of the introduced pepper trees (*Schinus molle*, Linn.)

18th December.—Saw two Brown Hawks chasing a Wedge-tailed Eagle. On the western edge of an open plain was a large bushy white-wood (*Atalaya hemiglaucæ*, F. v. M.) covered with clusters of the peculiar winged seeds, and in the top was a new nest of a Bower-Bird containing two eggs, which were darker than the pair taken 14/11/11. Nest was unusually well hidden, and placed up nearly 26 feet. (Plates XV., XVI.) While I was at the nest one bird sat in a green wilga 10 yards away making all kinds of peculiar sounds and mimicking various local birds to perfection, and also the mew of a domestic cat. While writing notes *re* the find, I saw the Bower-Bird fly back into the top of the tree near where the nest was. It then flew a good distance low down, within a few feet of the ground. They can frequently get from one part to another unnoticed by this mode of flight, and especially so in places where there is any small growth to hide them, such as salt-bush (*Chenopodiaceæ*), &c. Following in the direction of the bird's flight, bower No. 8 was discovered; this was a few hundred yards due west of the tree which contained the nest. The play-ground ran north and south, and was large and beautiful, and had great quantities of bleached bones of sheep, &c., as well as glass and glass stoppers, seed-pods, pieces of wire, tea lead, small stones, &c. It was placed under a large, spreading bush of the native red currant (*Exocarpus aphylla*, R. Br.) Close beside it was an old bower. The walls of this bower were (like the rest) constructed of the dry stems of the blue-grass. Walls were 12 inches high and 18 inches long through the passage-way, width inside $8\frac{1}{2}$ inches. All the new bowers found were photographed. Found a nest and eggs of Crested Bell-Bird in a clump of sand-ridge honeysuckle (*Canthium oleifolium*, Hook.) which was in full flower and giving off a delightful vanilla-like perfume. Crested Pigeons breeding freely, and a number of nests and eggs daily seen

19th December.—Four Bower-Birds at camp at daylight, and two of them again "displaying." When the sun shines on the expanded lilac patch, it has a peculiar transparent appearance, adding considerably to its beauty. One of the birds entered the tent and picked

up some candle droppings from the floor, eyeing me the while. They seem to eat a variety of things, and are tame about the camp, though shy and wary in the bush. My eyes are very sore from the Barcoo flies. Saw a "bush tragedy"—the dried carcass of an Emu hanging from a fence by one leg, which had caught and become twisted in the wires.

20th December.—Crimson-winged Lories plentiful, and feeding on the seed of the leopard-woods. Saw Bower-Birds flying low down again to-day, keeping only a few feet from the ground.

PLATE XVI.



Nest and Eggs of Spotted Bower-Bird.

FROM A PHOTO. BY S. W. JACKSON

21st December.—Went a long distance northwards towards the Queensland border fence, into the extreme north-west corner of Cambo Cambo property, and where it joins and meets Goondooblue and Burrenbah stations. Here I found a new and handsome bower (No. 9), placed under the shade of a native red currant bush (*Exocarpus aphylla*, R. Br.) (Plates XVII., XVIII.) Bird seen leaving play-ground. Much decoration, but chiefly bleached sheep-bones; also a number of Emu toe-bones. Other objects were two pieces bleached white Emu egg-shell, various seed-pods and berries, few pieces of glass, several heart-shaped berries (*Pittosporum phillyroides*, DL.), &c. In the passage-



Play-ground of Spotted Bower-Bird (*Chlamydoxera maculata*) under Currant bush.



Play-ground under Currant bush.

FROM A PHOTO, BY S. W. JACKSON.

way were displayed small bones and seeds, and nine large and two small green and long cigar-shaped pods of the native silk-vine (*Marsdenia leichhardtiana*, F. v. M.) Length of bower proper, not including decorations outside ends of passage, was 24 inches; width (over all) to edges of outside walls, 20 inches; width inside passage, 7½ inches; height of grass walls, 14½ inches. Bower runs east and west. Walls composed of dead stems of blue-grass (*Andropogon sericeus*, R. Br.) Hunted about and found a new nest (a perfect specimen) north of the bower about 400 yards. It was apparently ready for eggs, and was placed in a green sand-ridge belah (*Casuarina stricta*, Ait.), 24 feet from the ground. Found several old ones also at this part. Met Mr. Melville Doyle, and showed him the nests, in order that he might know any when he came across them when out riding. Showed him also No. 9 bower. This is the first one I have seen with so many silk-vine pods in it at the one time. One old nest of the Bower-Bird was only 6 feet 8 inches from the ground in a small green bumble tree (*Capparis mitchelli*, Lindl.), and was the lowest that has come under observation. The tree stood on the edge of a plain. Early this morning a powerful "willie willie" passed close to the camp. It is fortunate that it did not strike the tent.

22nd December.—Walked about 7 miles to the north-west of camp. Found few more old nests of Bower-Birds. Did a big day's tramp.

23rd December.—Few Bower-Birds about. Probably few are breeding, owing to the dry weather. "Willie willies" getting very severe, and am afraid if one strikes my camp much will be lost.

24th December.—Flock of about 100 Rose-breasted Cockatoos drinking at clay tank early this morning; they made a great noise. Did not see a single Bower-Bird to-day. Everything still and hot.

25th December.—A Bower-Bird opened Christmas Day by carrying on its wonderful mimicry on top of my tent early this morning. Much smoke about from bush-fires. Made a great effort to-day to take an instantaneous photograph in front of camp of a Bower-Bird "displaying," but the heat had affected my camera to such a degree that the instantaneous shutter would not work. Magpies, Grey Struthideas, Black-throated Butcher-Birds, Crested Pigeons, and Bower-Birds picked about the camp to-day. Temperature 100 degrees at midnight.

26th December.—Boxing Day. Nothing to note.

27th December.—Took photographs showing Bower-Birds' nests in trees, &c. (Plate XIX.) Found an unusually neat nest of Bower-Bird in a green belah tree, containing two young birds. They appeared only a few days old, and were covered with fine brown down. Mouths yellow inside, skin on head and body black. (Plate XX.) Nest placed 17 feet from the ground; situation 3 miles north-east of camp and close to Cambo Cambo homestead. The birds which owned this nest belonged to No. 2 bower. While I was at the nest the female darted at me, then went into an adjoining tree and made strange noises and much mimicry, imitating Magpie, Grey Butcher-Bird, Grey Struthidea, Noisy Miner, Ground Cuckoo-Shrike, &c. The young birds were kept at the camp for some days. They took food readily, but one very hot day they died, in spite of great care.

28th December.—Busy photographing to-day. Developed more plates to-night, retiring at 2.30 a.m.



Site of Bower-Bird's Nest in Cypress Pine.

FROM A PHOTO, BY S. W. JACKSON.

29th December.—Hundreds of Rose-breasted Cockatoos about camp. During September they were mostly in pairs. Clay tank at camp drying up rapidly. Find Bower-Birds beginning to neglect their bowers. Visited some to-day. Sun lurid to-night when setting.

30th December.—Rose-breasted Cockatoos all with wings drooping. Many hundreds of different birds drinking around the clay tank at sunset. Often try to follow Bower-Birds after they have a drink and leave the tank or dam, but they are soon lost.

31st December.—Had another severe storm last night, and over an inch of rain; the big cracks in the ground soon drank it down. Birds all happy and calling since the rain.

1st January (1912).—Walked some miles to the west, and found few more very old nests of Bower-Birds. White-wood trees now have a rusty appearance on account of the clusters of seed-pods being ripe. Came across a small gruie or Emu apple tree laden with the rose-coloured fruit and just beyond the reach of the Emus. The fruit is pleasant to eat, though tart. The seed is a round, hard ball about the size of a nutmeg. The trees are pretty, giving splendid shade, and mostly growing on the open plains here and there.

2nd January.—Mr. Melville Doyle kindly called to inform me he had discovered a Bower-Bird's nest, about $3\frac{1}{2}$ miles north of the camp. On climbing, I found one handsome egg (much incubated). The nest was placed in the middle of a mistletoe clump in a green white-wood tree. The nest was 24 feet from the ground, and the tree stood amongst much dead, ring-barked timber. When we got near the tree Mr. Doyle cracked his whip and flushed the female. While I was up at the nest the female sat in a dead tree not far away and made the usual strange sounds. Saw numbers of *Acanthiza albiventris*. They utter a sweet little note.

3rd January.—Bright moonlight night, and a Boobook Owl (*Ninox boobook*) calling in the direction of the Moonie River, also Bush-Curlews or Stone-Plovers (*Burhinus grallarius*).

4th January.—Found another new nest of Bower-Bird ready for eggs. The nest was built and well hidden in a clump of mistletoe, in a white-wood tree at a height of 21 feet. Watched the bird with glasses, and saw it collecting and carrying small dead twigs from a cunnyanna tree (*Ventilago viminalis*, Hook.) for lining the nest. Tree less than half a mile north from camp. Each time the bird arrived with a twig it settled on the top projecting limb and cautiously hopped gradually down to the nest; when leaving it went from the summit of the tree. Native lime trees now finished bearing fruit.

A CYCLONE.

5th January.—Went north-east. Saw pair of Orioles (*Oriolus sagittarius*). Visited locality where new nest of Bower-Bird was found in white-wood yesterday. I hid about 100 yards away, and with the field-glasses saw the bird arrive with a thin twig and hop down into the nest. I then left the spot at once. On a tree which I photographed there were two species of mistletoe growing—one with the yellow tassel-like flower, and *Loranthus linearifolius* (Hook.), which has a red and green bell-like flower. Saw several Mistletoe-Birds (*Dicaeum hirundinaceum*). Had a cyclone with heavy rain at 6.20 p.m. Much damage done, and trees blown down everywhere. It was



Nest and Young of Spotted Bower-Bird (*Chlamydodera maculata*).

fortunate that my assistant and I got back to camp in time. Some of the things disappeared and were never seen again. Tin dishes and plates were blown away and bent into all shapes. Some large trees about the camp snapped off at their bases.

6th January.—Evidences of the gale everywhere, and numerous trees down. No. 1 bower completely wrecked. The new nest of the Bower-Bird in the mistletoe in the white-wood had been blown out of position and was hanging on the side of the mistletoe. Mr. M. Doyle rode out to see how I had weathered the gale, as much damage had been done about the homestead, and places unroofed, including a good part of the wool-shed. The boobialla tree from which I took a nest and eggs of Bower-Bird on 14/11/1911 was blown down. A number of the old nests also went. East of camp we saw a great flock of nearly 60 Native Companions, not far from No. 3 bower. Native name of these birds is "Brolga." Saw several more Ground Cuckoo-Shrikes; their peculiar note soon attracts attention. Their forked tail is very conspicuous when flying. They mostly call on the wing. Bunary trees (*Heterodendron oleaceifolium*, Desf.) now in seed.

7th January.—Saw no Bower-Birds at camp to-day or in the bush. I fear they will not reconstruct No. 1 bower again.

8th January.—Visited No. 2 bower and photographed it, it being well sheltered from the storm. Shot and preserved a handsome male specimen of the Black-backed Wren (*Malurus melanonotus*). Measurements of the bird in the flesh are as follows.—Total length, 59 mm.; wing, expanded, 31½ mm.; tarsus, 11 mm.; bill, 6 mm.; tail, 26 mm. Colour of eyes black. Also procured *Acanthiza albiventris*, North: Measurements:—Total length, 53 mm.; wing, 37 mm.; bill, 6 mm.; tarsus, 9 mm.; tail, 21 mm. Eyes cream colour, with black centre. Found nest containing two young Crested Pigeons. Colour, grey; bills blackish, with white tips; small crests on head; very tame.

9th January.—Mr. Melville Doyle called at camp to-day, and kindly drove me to Eulalie station, which lies some 12 miles north-east of Cambo Cambo. On the way, and when passing through Dumiendi station, an old nest of a Bower-Bird was found in a mulga tree (*Acacia aneura*, F. v. M.) I saw none of these trees on Cambo Cambo. Passed through vast areas of prickly pear plants, and noticed that much of the ripe fruit had been pecked by birds, &c. Saw the Eulalie bore flowing, with an output of 400,000 gallons per day, and it has made a swamp near it, which is covered in some parts with lignum bush (*Muehlenbeckia cunninghami*, F. v. M.) Here observed the following birds feeding:—Black Ducks, Wood-Ducks, White-headed Stilts, Straw-necked Ibis, White Egrets, Yellow-legged Spoonbills, and Pacific Herons. The birds were tame, and did not fly on our approach. Saw only one Bower-Bird to-day, and I travelled about over fully 30 miles of country in all. I think they must have been congregated about parts where fruit trees were in bearing. Saw many cubbaroo trees (*Eucalyptus odorata*, Behr.) growing in the bush at Eulalie to-day. Tree something like coolibah but smaller, and has smaller leaves and darker bark. Mr. W. H. Treweeke informed me that in some of the Bower-Birds' play-grounds not far from his house, the birds often have bright metal sparklet bulbs displayed in the decorations.

10th January.—Three Bower-Birds at my camp this morning. Took more photographs of trees containing Bower-Birds' nests;

Camera cracked to-day with the heat, and fell off the tripod. Developed plates, and retired at 3.20 a.m.

11th January.—The mirage on the plains to-day was very pronounced. Five Bower-Birds at camp at 6 a.m. A Magpie, which was feeding young close by, chased one away. Many birds now appear to be retiring, including Red-capped Robins, Crested Bell-Birds, Spiny-cheeked Honey-eaters, Reddish-crowned Fly-eaters, &c. Two Bower-Birds hopped upon my camp table again this morning and walked over tin plates and pannikins. Repaired broken camera.

12th January.—No Cuckoos' eggs of any species found to date. Cuckoos seldom seen or heard.

13th January.—Several Bower-Birds at camp this morning, again displaying their beautiful napes, which were iridescent in the sun. Took more photos. Walking 10½ hours in the heat with heavy camera, &c. Sunset transformed from golden yellow to pale pink.

14th January.—Saw no Bower-Birds at all to-day. Grass getting green in some parts here now since the storms.

15th January.—Went several miles north-west in company with Mr. Clyde Doyle and took some photos., including No. 9 bower. The new nest in the sand-ridge below, found some days ago and belonging to the birds of No. 9 bower, was still empty; probably the birds have left it. They are very wary. Noticed several White-plumed Honey-eaters (*Ptilotis penicillata*) drinking at the edge of a clay tank on Burrenbah station which lies a little north of No. 9 bower. These Honey-eaters are generally found near water. Saw many birds sheltering again from the heat to-day.

16th January.—Barcoo flies worse than ever. Bower-Birds again "displaying" at camp, and hopping about with drooping wings. Very hot; had six hours' walking in it.

17th January.—Saw Bower-Birds eating mutton fat from a can at the camp fire-place. Strange birds—shy in the bush, but tame at the camp. Took more photos., travelling over a lot of ground on foot. Bowers are now all neglected. Developed and washed plates, retiring at 4 a.m.

18th January.—Water in clay tank now quite green. Found a goanna feeding on some coarse salt at camp this morning. Photographed more nests, &c., in the bush. Leopard-woods have dropped all their seeds, and Crimson-winged Lories still feeding on them. Noticed some young of Ground Cuckoo-Shrike.

19th January.—No. 3 bower has been enlarged since first I found it, and the grass walls measure 38 inches long, and the width of bower to the outside edges of the walls was 22 inches; height of walls, 15 inches. I collected some of the articles of decoration from a few of the bowers, including No. 1 bower, which was wrecked by the cyclone on the 5th inst. Saw flock of six Cockatoo-Parrakeets (*Calopsittacus novæ-hollandiæ*); not many so far. Saw three Blue-faced Honey-eaters (*Entomyza cyanotis*). Noticed no Bower-Birds during my whole day's walk. Peaches and other fruits were now ripe at the fruit garden at Goondooluie station homestead, some 8 miles east of camp, and other places, and probably many of these birds had congregated there to feed. Mr. Murray has some of the peach trees, &c., there, bearing ripe fruit, covered with large nets in order to keep off the

Bower-Birds, yet they get inside at times, and are captured alive by the gardener. The grapes also at Goondoobluie are kept covered over sides and top with wire netting, yet Mr. Murray informed me that a Bower-Bird sometimes finds its way inside even this protection. Noticed good-sized black *Cicadæ* (locusts) in the budda trees to-day, and the Ground Cuckoo-Shrikes were chasing and devouring them.

20th January.—A few Bower-Birds visited my camp this morning. I took more photographs. Birds all very silent to-day. Very hot. The budda trees (*Eremophila mitchelli*, Benth.), which are one of the favourite species for the Bower-Birds to build in, are in flower again, their second flowering since my arrival. The blossoms are white and bell-like, though in some cases I have noticed all the flowers on a tree here and there to have a faint tinge of pink. Developed and washed photographic plates; some of the films melted much, owing to the great heat.

21st January.—The little *Acanthiza albiventris* have a sweet but feeble note, and often visit the green wilga tree at the head of my camp, where they collect small insect food, both from the leaves and the bark. Packed up many articles, and got ready to break up camp to-morrow.

22nd January.—Camp was taken down, and all the cases of specimens and my camping paraphernalia were carted in to the station homestead, where I remained some days packing everything, ready to be carted to railway station at Collarenebri East.

CONCLUSION.

During my stay at the homestead I shot and preserved several Spotted Bower-Birds which used to visit a small peach tree close to the house. I left the shooting of the birds until the last, in order to prevent the possibility of destroying any bird or birds belonging to nests which were under observation. While feeding in this peach tree the birds often carried on their wonderful mimicry, including a remarkable metallic wire-like sound previously mentioned. The birds also came on the verandah, and even visited the kitchen. One day Mr. M. Doyle kindly drove me to see the new bore at Goondoobluie station. The output then (24th January, 1912) was 742,000 gallons per day. Temperature of water on leaving the bore pipe was 138 degrees Fahr.; depth of bore, 3,535 feet. This bore is beside the wool-shed there. The water from this bore quenches the thirst of thousands of various birds as well as sheep, &c., and as we drove along I saw a number of Black Ducks (*Anas superciliosa*) and many other birds on the bore drain, which extends for many miles over this flat country.

I saw some Bower-Birds at the peach tree and tomato vines at the Cambo Cambo homestead again, the fruit of the latter being picked hollow. Noticed on the under side of large "carbuncles" on river gums and Moreton Bay ash (eucalypts) on the banks of the Moonie River, the Fairy Martins (*Petrochelidon ariel*) had built numbers of their bottle-shaped mud nests. Took photos. of same. Noticed several Blue-faced Honey-eaters feeding on the red blossoms of a mistletoe growing on the coolibah trees. Moonie River drying up rapidly, and very little water left in it about the homestead. Altogether 123 different species of birds were noted during the trip. Among the Bower-Birds which I shot and preserved were some females possess-

ing the lilac nape, which hitherto I always understood were only on the males. The eyes of the Spotted Bower-Bird are large and dark brown in colour, with a large black centre. The altitude of every Spotted Bower-Bird's nest found on the trip was taken, also name of the tree, circumference of same 1 foot up from the ground, and position of tree from camp. Altogether I found 95 nests, the bulk of which, of course, were very old—or 96 including the one found by Mr. M. Doyle—and were placed in no less than 17 different species of trees, which were as follow:—23 in buddas (*Eremophila mitchelli*), 17 in white-woods (*Atalaya hemiglaucæ*), 15 in cypress pines (*Callitris robusta*), 8 in wilgas (*Geijera parviflora*), 6 in bumbles (*Capparis mitchelli*), 6 in leopard-woods (*Flindersia maculosa*), 3 in needle-woods (*Hakea leucoptera*), 3 in belahs (*Casuarina lepidophloia*), 3 in bunarys (*Heterodendron oleæfolium*), 2 in cunnyannas (*Ventilago viminalis*), 2 in beef-woods (*Grevillea striata*), 2 in sand-ridge belahs (*Casuarina stricta*), 2 in wattles (*Acacia longifolia*), and 1 each in boobialla (*Myoporum acuminatum*), blood-wood (*Eucalyptus terminalis*), iron-wood (*Acacia excelsa*), and mulga (*Acacia aneura*). Twenty nests, including the new ones and the best of the old ones, were collected for Mr. H. L. White's museum, and they vary from shallow to rather deep cup-shaped structures; it depends on the position in which they are built, both as regards their size and depth. For instance, those found in mistletoes are usually smaller.

On the morning of the 5th February, 1912, I said farewell to my friends at the Cambo Cambo homestead, who had extended to me the greatest kindness during my visit, and had left no stone unturned to afford me assistance. At Collarenebri I remained a few days for further observations. Saw a number of Red-rumped Parrakeets (*Psephotus hæmatonotus*) and other birds in the eucalyptus trees along the banks of the Barwon River. Was surprised to see the numbers of Bower-Birds which were then frequenting a Chinese fruit and vegetable garden close to the town, eating grapes, peaches, and other fruits. I counted 35 of the birds one morning. This garden is irrigated by the water which is daily pumped from the river by an engine and is run over the ground in trenches and wells. The proprietor of the garden informed me that the Bower-Birds were "no good," and spoil his fruit, and that he had shot as many as 30 one morning from a fig tree. From this it would appear that these birds congregate here from the immediate district when the fruit is ripe. They also frequent the pepper trees in the streets and gardens of inland towns, and become very "cheeky," but always wary. Finally, I must thank those other persons with whom I came in contact during my visit for the kind help they gave me so freely, and only regret that it was my misfortune to strike such a bad (dry) season as then existed.

"American Ducks and How to Distinguish Them" is the title of succinctly written and popular articles, by Dr. R. W. Shufeldt, appearing in the *Outer's Book* (an excellent magazine devoted to outdoor interest). The articles are well illustrated with photographs and original drawings by the author. If Australian Ducks were written up in the way Dr. Shufeldt is treating the American species, much more could be learned about the former.

Internal Parasites Recorded from Australian Birds.

By T. HARVEY JOHNSTON, M.A., D.Sc., F.L.S., Biology Department, University of Queensland.

IN a paper, "On Australian Avian Entozoa," read before the Royal Society of New South Wales (June, 1910), I gave a list of the internal parasites * known to infest Australian birds, including introduced hosts, such as domesticated birds, Sparrows, &c., and also the literature referring to their occurrence. In the present list all records which do not refer to hosts coming from Australian native birds, either in Australia or in various Zoological Gardens, are rejected. I have, therefore, excluded a large number of hosts and records included in the former paper—viz., those from the Southern Ocean and from New Guinea and adjacent islands. In cases where the entozoa have been collected from specimens in foreign Zoological Gardens, the locality has been indicated in this census. When stated in the original record, the name of the State is given, thus—New South Wales (N.S.W.), Victoria (V.), South Australia (S.A.), Eastern Australia (E.A.), South-West Australia (S.W.A.), North-West Australia (N.W.A.), Southern Queensland, *i.e.*, south of Rockhampton (S.Q.), Northern Queensland (N.Q.). The great majority of the records refer to specimens collected in New South Wales and Queensland, while very few come from Victoria, and none, as far as I know, from Tasmania.

In the following list there are included only the records actually made, while the names of authors who have only incidentally dealt with the classification of particular parasites are not included.

In regard to the nomenclature of the birds, Mathews' "Hand-list" is followed, even though the bird has been quoted by the recorder under some other name, each host being given its corresponding number in that list. This method has been preferred, as it simplifies the identification. The classification of the parasite is indicated thus:—*a* = protozoon; *b* = tapeworm or cestode; *c* = fluke or trematode; *d* = roundworm or nematode; *e* = hook-headed worm or echinorhynch. Many of the entozoa are placed under a generic name only. In some cases this is due to the fact that specific identification is scarcely possible at present (*e.g.*, *Halteridium*, the so-called bird malaria parasites); in others only a larval form is recorded (*e.g.*, larval bloodworms or *Microfilaria*), while in others the entozoon has not been fully identified.†

The main papers dealing with the subject are those of Krefft (Trans. Ent. Soc. N.S.W., 1871); Dr. T. L. Bancroft (P. R. S., Queensland, 1890); Dr. Linstow (*Challenger Report*, 1888); Dr.

* The external parasites belonging to the group of *Mallophaga* (feather lice) found on Australian hosts have been listed by Mr. Launcelot Harrison and myself recently (Proc. Roy. Soc. Queensland, 1912).

† The term *Filaria* is used to designate both the adult form and the larval or microfilarial stage. *Echinostomum* and *Monostomum* are used in their wide sense, no attempt being made to place the specimens under the various genera into which these two have been subdivided. Dr. S. J. Johnston has undertaken to work out these trematodes.

S. J. Johnston (P. L. S., N.S.W.); Dr. Cleland and myself (P. R. S., N.S.W.; Tr. R. S., South Aust.; P. L. S., N.S.W.; P. R. S., Queensland; Rec. Austr. Museum; Ann. Rep. Townsville Tropical Institute); and Plimmer (Journ. Roy. Micr. Soc., 1912).

The main abbreviations used are—J. & C., C. & J. for Cleland and Johnston, and J., T. H. J., or Jnstn. for Johnston. Many of the records are now made for the first time.

Ornithologists are asked to assist in the collection of both internal and external parasites. Spirit is the best of the common preservatives for external parasites and for roundworms, while formalin (about 3 per cent.) is a good all-round preservative for tapeworms and flukes. Blood parasites are examined in blood-smear preparations, a small drop of blood being drawn across a glass micro-slide with a needle to form a very thin smear, the slide being then labelled with host's name and locality, and the smear being allowed to dry.

Tapeworms are found in the intestine; flukes in the intestine mainly, but also in other parts, such as the body cavity, &c.; hook-headed worms in the intestine, or—in their larval form—under the skin as small whitish nodules; while roundworms may be met with in any part of the digestive canal, in the body cavity or mesenteries, or under the skin.

| No. in Mathews' List. | Name of Host. | Name of Parasite. | Recorder and Locality |
|-----------------------|--------------------------------|---|--|
| 1 | <i>Dromæus novæ-hollandiæ</i> | <i>b. Davainea australis</i> (Krabbe) | Krabbe, 1869 (Copenhagen Zoo.); Johnston, 1909 (N.S.W.), 1910 (N.W.A.) |
| | | <i>Cotugnia collini</i> (Fuhr.) | Fuhrmann, 1909 (E.A.) |
| 7 | <i>Catheturus lathamii</i> .. | <i>a. Halteridium</i> , sp. .. | C. & J., 1911 (S.Q.) |
| | | <i>d. Heterakis bancrofti</i> (J.) | Jnstn., 1912 (S.Q.) |
| | | <i>H. catheturinus</i> (Jnstn.) | |
| 45 | <i>Lophophaps plumifera</i> | <i>e. Echinorhynchus</i> , sp. .. | Jnstn., 1912 (S.Q.) |
| | | <i>d. Filaria</i> , sp. .. | Plimmer, 1912 (London Zoo.) |
| 47 | <i>Leucosarcia picata</i> .. | <i>b. Davainea</i> , sp. .. | Jnstn., 1912 (N.S.W.) |
| 62 | <i>Porphyrio melanotus</i> | <i>c. Distomum</i> , sp. .. | Kreffit, 1871 (E.A.) |
| 65 | <i>Podiceps novæ-hollandiæ</i> | <i>b. Tænia novæ-hollandiæ</i> (Kreffit) | Kreffit, 1871 (E.A.) |
| | | <i>Tænia paradoxa</i> (Krf.) | Kreffit, 1871 (E.A.) |
| 101 | <i>Daption capensis</i> .. | <i>d. Rictularia shipleyi</i> (Stoss)* | Jnstn., 1912 (N.S.W.) |
| 109 | <i>Diomedea exulans</i> .. | <i>b. Tetrabothrius</i> , sp. .. | Jnstn., 1912 (N.S.W.) |
| 112 | <i>D. melanophrys</i> .. | <i>Tetrabothrius</i> , sp. .. | Jnstn., 1912 (N.S.W.) |
| 125 | <i>Sterna bergii</i> .. | <i>c. Holostomum musculosum</i> (Jnstn., S. J.) | Johnston (S. J.), 1904 (N.S.W.) |

* This record is based upon material collected near Sydney by Mr. L. Harrison. His description of the parasite satisfies me that the worm was *Rictularia*, and most probably *R. shipleyi*. Unfortunately, the nematodes have been mislaid, and I am therefore, at present, unable to confirm the specific identity.

| No. in Mathews List. | Name of Host. | Name of Parasite. | Recorder and Locality. |
|----------------------------|---------------------------------------|--|--|
| 137 | <i>Larus novæ-hollandiæ</i> | <i>c. H. hillii</i> (Jnstn., S. J.) | Johnston (S. J.), 1904 (N.S.W.) |
| 149 | <i>Zonifer tricolor</i> .. | <i>b. Choanotænia zoniferæ</i> (Jnstn.) | Jnstn., 1912 (N.S.W.) |
| 151 | <i>Charadrius dominicus</i> | <i>c. Echinostomum</i> , sp. .. | Jnstn., 1910 (N.S.W.) |
| 161 | <i>Himantopus leuco- cephalus</i> | <i>b. Acoelu. hedleyi</i> (John- ston) * | Jnstn., 1910, 1912 (N.S.W., S.A.), Krefft, 1871 (N.S.W.) |
| | | <i>Gyrocalcia australien- sis</i> (Jnstn.)† | Jnstn., 1910, 1912 (N.S.W., S.A.), Krefft, 1871 (N.S.W.) |
| | | <i>Davainea himantopodis</i> (Jnstn.) | Jnstn., 1910, 1911 (S.A.) |
| | | <i>Hymenolepis</i> , sp. .. | Jnstn., 1910 (S.A.) |
| | | <i>c. Monostomum</i> , sp. .. | Jnstn., 1910 (S.A.) |
| 164 | <i>Numenius cyanopus</i> | <i>c. Echinostomum</i> , sp. .. | Jnstn., 1912 (S.Q.) |
| | | <i>d. Echinorhynchus</i> , sp. .. | Jnstn., 1912 (S.Q.) |
| 185 | <i>Gallinago australis</i> .. | <i>b. Aploparaksis australis</i> (Jnstn.) | Jnstn., 1912 (N.Q.) |
| 194 | <i>Ibis molucca</i> .. | <i>c. Echinostomum</i> , sp. .. | Jnstn., 1912 (S.Q.) |
| 197 | <i>Platalea regia</i> .. | <i>b. Cycloorchida omalan- cristota</i> (Wedl.) | Jnstn., 1912 (N.Q.) |
| 198 | <i>Platibis flavipes</i> .. | <i>b. Hymenolepis ibidis</i> (Jnstn.) | Jnstn., 1912 (N.Q.) |
| 199 | <i>Xenorhynchus asi- aticus</i> | <i>b. Clelandia parva</i> (John- ston) | Jnstn., 1909 (N.S.W.) |
| 203 | <i>Herodias timoriensis</i> | <i>b. Anomotænia asym- metrica</i> (Jnstn.) | Jnstn., 1912 (N.Q.) |
| | | <i>Bancroftiella glandu- laris</i> (Fuhrm.) | Jnstn., 1912 (N.Q.) |
| | | <i>c. Distomum</i> , sp. .. | Krefft, 1871 (E. A.) |
| | | <i>Echinostomum</i> , sp. .. | Jnstn., 1912 (S.Q.) |
| 204 | <i>Notophox novæ-hol- landiæ</i> | <i>b. Bancroftiella glandu- laris</i> (Fuhrm.) | Jnstn., 1912 (N.Q., N.S.W.) |
| | | <i>c. Holostomum simplex</i> (Jnstn., S. J.) | Jnstn. (S. J.), 1904 (N.S.W.) |
| 205 | <i>N. pacifica</i> .. | <i>c. Distomum</i> , sp. .. | Krefft, 1871 (E.A.) |
| 210 | <i>Nycticorax caledonicus</i> | <i>b. Bancroftiella ardæ</i> (Jnstn.) | Jnstn., 1912 (N.Q.) |
| | | <i>Hymenolepis</i> , sp. .. | Jnstn., 1912 (N.S.W.) |
| 216 | <i>Chenopsis atrata</i> ... | <i>b. Hymenolepis liophallos</i> (Krabbe) | Krabbe, 1869 (Europe) |
| | | <i>H. micrancristota</i> (Wdl.) | Wedl. (Hungary) |
| | | <i>c. Hemistomum interme- dium</i> (Jnstn., S. J.) | Jnstn. (S. J.), 1904 (N.S.W.) |
| | | <i>Monostomum</i> , sp. .. | Jnstn., 1910 (V.) |
| | | <i>d. Heterakis vesicularis</i> (Rud.) | Schneider, 1866 (Ber- lin Zoo.) |
| | | <i>H. circumvallata</i> (Lin.) | Linstow, 1906 (Königsberg) |
| 217 | <i>Anseranas semipal- mata</i> | <i>b. Hymenolepis megalops</i> (Nitzsch) | Jnstn., 1912 (N.Q.) |
| | | <i>H. terræreginæ</i> (Jnstn.) | Jnstn., 1912 (N.Q.) |
| 221 | <i>Chenonetta jubata</i> .. | <i>d. Heterakis chenonettæ</i> (Jnstn.) | Jnstn., 1912 (N.S.W.) |

* Syn. *Tænia rugosa*, Krefft, nec Diesing.† Syn. *Tænia coronata*, Krefft, nec Rudolphi.

| No. in Matthews' List. | Name of Host. | Name of Parasite. | Recorder and Locality. |
|------------------------------|---------------------------------|--|--|
| 222 | <i>Dendrocygna arcuata</i> | b. <i>Diploposthe lævis</i> (Bl.) | Justn., 1912 (N.Q.) |
| 225 | <i>Casarca tadornoides</i> | a. <i>Hæmoproteus danielowskyi</i> | Plimmer, 1912 (London Zoo.) |
| 226 | <i>Anas superciliosa</i> .. | b. <i>Hymenolepis megalops</i> (Nitzsch) * | Justn., 1912 (N.S.W.), Kreffit, 1871 (E.A.) |
| | | <i>H. collaris</i> (Batsch) † | Justn., 1912 (N.S.W.), Kreffit, 1871 (E.A.) |
| | | <i>Hymenolepis</i> , sp. .. | Justn., 1912 (N.S.W.) |
| | | <i>Diorchis flavescens</i> (Kreffit) | Kreffit, 1871 (E.A.), Justn., 1912 (N.S.W., S.Q., N.Q.) |
| | | <i>Fimbriaria fasciolaris</i> (Pall.) ‡ | Justn., 1910, 1912 (N.S.W.); Krefft, 1871 (E.A.) |
| | | <i>Diploposthe lævis</i> (Bl.) | Justn., 1912 (N.S.W.) |
| | | c. <i>Echinostomum</i> , sp. .. | Justn., 1912 (N.S.W., S.Q.) |
| 227 | <i>Nettion castaneum</i> .. | a. <i>Halteridium</i> , sp. .. | J. & C., 1909 (N.S.W.) |
| | | b. <i>Diorchis flavescens</i> (Kreffit) | Justn., 1912 (N.S.W.) |
| | | <i>Diploposthe lævis</i> (Bl.) | Justn., 1912 (N.S.W.) |
| | | <i>Hymenolepis collaris</i> (Bat.) | Justn., 1912 (N.S.W.) |
| | | <i>H. megalops</i> (N.) .. | Justn., 1912 (N.S.W.) |
| | | <i>Fimbriaria fasciolaris</i> (Pall.) | Kreffit, 1871, Justn., 1912 (N.S.W.) |
| 231 | <i>Spatula rhynchotis</i> .. | b. <i>Diorchis flavescens</i> (Kreffit) | Kreffit, 1871, Justn., 1912 (N.S.W.) |
| 234 | <i>Aythya australis</i> .. | b. <i>Diploposthe lævis</i> (Bl.) | Kreffit, 1871, Justn., 1912 (N.S.W.) |
| | | <i>Diorchis flavescens</i> (Kreffit) | Justn., 1912 (N.S.W.) |
| 236 | <i>Biziura lobata</i> .. | a. <i>Proteosoma biziuræ</i> (G., S., & D.) | Gilruth, Sweet, and Dodd, 1910 (V.) |
| | | b. <i>Tænia moschata</i> (Krf.) | Kreffit, 1871, Justn., 1912. |
| 242 | <i>Plotus novæ-hollandiæ</i> | d. <i>Filaria</i> , sp. .. | Justn., 1912 (S.Q.) |
| | | <i>Ascaris spiculigera</i> (Rud.) | Justn., 1912 (S.Q.), Kreffit, 1871. |
| 237 | <i>Phalacrocorax carbo</i> | <i>Ascaris</i> , sp. .. | Justn., 1912 (N.S.W.) |
| 238 | <i>P. sulcirostris</i> .. | <i>Filaria</i> , sp. .. | Justn., 1912 (S.Q.) |
| | | <i>Ascaris spiculigera</i> (Rud.) | Justn., 1912 (S.G.) |
| 241 | <i>P. melanoleucus</i> .. | <i>Filaria</i> , sp. .. | C. & J., 1911 (N.S.W.) |
| 247 | <i>Fregata aquila</i> .. | b. <i>Tetrabothrius</i> , sp. .. | Justn., 1912 (S.Q.) |
| 252 | <i>Pelecanus conspicillatus</i> | d. <i>Ascaris spiculigera</i> (Rud.) (?) | Justn., 1912 (S.W.A.) |
| 256 | <i>Astur novæ-hollandiæ</i> | e. <i>Gigantorhynchus asturinus</i> (Justn.) | Justn., 1912 (N.Q.) |
| 258 | <i>Astur fasciatus</i> .. | e. <i>Echinorhynchus</i> , sp. .. | Justn., 1910 (N.S.W.) |
| 260 | <i>Accipiter cirrhocephalus</i> | b. <i>Anomotænia accipitris</i> (Justn.) | Justn., 1912 (N.Q.) |

* Syn. *Tænia cylindrica* (Kreffit).† Syn. *Tænia bairdii* (Kreffit).‡ Syn. *Tænia pediformis* (Kreffit).¶ Syn. *Tænia tuberculata* (Kreffit).

¶ Krefft's specimens lost—species not identifiable.

| No. in Mathews List. | Name of Host. | Name of Parasite. | Recorder and Locality. |
|----------------------------|-------------------------------------|--|--|
| 260 | <i>Accipiter cirrhocephalus</i> | <i>d. Filaria</i> , sp. . . . | C. & J., 1911 (S.Q.) |
| 277 | <i>Falco lunulatus</i> .. | <i>d. Filaria</i> , sp. . . . | Jnstn., 1910 (W.A.) |
| 278 | <i>Hieracidea berigora</i> .. | <i>Filaria guttata</i> (Schn.) | Schneider, 1866 (S.A.) |
| 283 | <i>Ninox boobook</i> .. | <i>a. Halteridium</i> , sp. . . | C. & J., 1911 (S.Q.) |
| | | <i>b. Filaria</i> , sp. . . . | Jnstn., 1912 (V.) |
| | | <i>e. Echinorhynchus</i> , sp. . | Jnstn., 1912 (S.Q.) |
| 285 | <i>N. ocellata</i> .. | <i>b. Filaria</i> , sp. . . . | Jnstn., 1912 (N.W.A.) |
| 301 | <i>Trichoglossus novæ-hollandiæ</i> | <i>b. Moniezia trichoglossi</i> (Linst.) | Linstow, 1888 (N.Q.), Jnstn., 1912 (N.Q.) |
| 309 | <i>Glossopsittacus pusillus</i> | <i>d. Filaria</i> , sp. . . . | Bancroft, 1890 (S.Q.) |
| 320 | <i>Cacatua galerita</i> .. | <i>Filaria</i> , sp. . . . | C. & J., 1911 (S.Q.) |
| | | <i>b. Davainea cacatuina</i> (Jnstn.) | Jnstn., 1912 (S.Q.) |
| 336 | <i>Platycercus adalaidæ</i> | <i>a. Halteridium</i> , sp. . . | C. & J., 1911 (S.A.) |
| 343 | <i>P. eximius</i> .. | <i>b. Dilepis bancrofti</i> (Jnstn.) | Jnstn., 1912 (N.S.W.) |
| 347 | <i>P. icterotis</i> .. | <i>d. Filaria</i> , sp. . . . | Plimmer, 1912 (London Zoo.) |
| 376 | <i>Podargus strigoides</i> .. | <i>Filaria</i> , sp. . . . | Bancroft, 1890 (S.Q.), C. & J., 1911 (S.Q.) |
| 381 | <i>Eurystomus pacificus</i> | <i>e. Echinorhynchus</i> , sp. . | Jnstn., 1912 (S.Q.) |
| | | <i>Filaria</i> , sp. . . . | Bancroft, 1890 (S.Q.), C. & J., 1911 (S.Q.) |
| 386 | <i>Dacelo gigas</i> .. | <i>a. Halteridium</i> , sp. . . | Jnstn., 1910 (N.S.W.) |
| | | <i>b. Similuncinus daceionis</i> (Jnstn.) | Jnstn., 1909 (N.S.W.) |
| | | <i>c. Hemistomum triangulare</i> (Jnstn., S. J.) | Jnstn. (S. J.), 1904 (N.S.W.) |
| 391 | <i>Halcyon sanctus</i> .. | <i>e. Echinorhynchus</i> , sp. | Jnstn., 1910 (N.S.W.) |
| 393 | <i>H. vagans</i> .. | <i>d. Filaria</i> , sp. . . . | Jnstn., 1912 (Lord Howe Island). |
| 396 | <i>Merops ornatus</i> .. | <i>a. Halteridium</i> , sp. . . | C. & J., 1911 (S.Q.) |
| 418 | <i>Menura superba</i> .. | <i>e. Echinorhynchus menuræ</i> (Jnstn.) | Jnstn., 1912 (N.S.W.) |
| 433 | <i>Micræca fasciatus</i> .. | <i>a. Halteridium</i> , sp. . . | C. & J., 1911 (S.Q.) |
| | | <i>Trypanosoma anellobiæ</i> (C. & J.) | C. & J., 1911 (S.Q.) |
| | | <i>c. Echinostomum</i> , sp. . . | Jnstn., 1912 (S.Q.) |
| 440 | <i>Petræa phænicea</i> .. | <i>a. Halteridium</i> , sp. . . | C. & J., 1911 (N.S.W.) |
| 444 | <i>P. goodenovii</i> .. | <i>b. Hymenolepis</i> , sp. . . | Jnstn., 1910 (S.A.) |
| 488 | <i>Myiagra rubecula</i> .. | <i>d. Filaria</i> , sp. . . . | Bancroft, 1890 (S.Q.) |
| 490 | <i>M. nitida</i> .. | <i>a. Halteridium</i> , sp. . . | Jnstn., 1910, C. & J., 1910 (N.S.W.) |
| 504 | <i>Coracina robusta</i> .. | <i>d. Filaria</i> , sp. . . . | Jnstn., 1912 (S.Q.) |
| 524 | <i>Hylacola pyrrhopygia</i> | <i>e. Echinorhynchus pomatostomi</i> (J. & C.) | J. & C., 1911 (S.A.) |
| 526 | <i>Psophodes crepitans</i> | <i>d. Filaria</i> , sp. . . . | C. & J., 1911 (S.Q.) |
| | | <i>e. Echinorhynchus</i> , sp. . | Jnstn., 1910 (N.S.W.) |
| 529 | <i>Pomatostomus frivolis</i> | <i>d. Filaria</i> , sp. . . . | Bancroft, 1890 (S.Q.) |
| | | <i>e. Echinorhynchus pomatostomi</i> (J. & C.) | J. & C., 1911 (N.S.W.) |
| 530 | <i>P. superciliosus</i> .. | <i>a. Halteridium</i> , sp. . . | Jnstn., 1910, C. & J., 1910 (S.A.) |
| | | <i>e. Echinorhynchus pomatostomi</i> (J. & C.) | J. & C., 1911, Jnstn., 1910 (S.A.) |
| 532 | <i>P. rubeculus</i> .. | <i>e. Echinorhynchus pomatostomi</i> (J. & C.) | Jnstn., 1910, J. & C., 1911 (N.W.A.) |

| No. in Mathews' List. | Name of Host. | Name of Parasite. | Recorder and Locality. |
|-----------------------------|-----------------------------------|--|---|
| 544 | <i>Oreocichla lunulata</i> .. | <i>a. Halteridium</i> , sp. .. <i>d. Filaria</i> , sp. .. <i>e. Echinorhynchus</i> , sp. | C. & J., 1909 (N.S.W.) Jnstn., 1910 (N.S.W.) Jnstn., 1910 (N.S.W.) |
| 593 | <i>Malurus cyaneochlamys</i> | <i>b. Choanolenia taylora</i> (J.) | Jnstn., 1912 (N.S.W.) |
| 624 | <i>Artamus leucogaster</i> | <i>d. Filaria</i> , sp. .. | C. & J., 1911 (S.Q.) |
| 634 | <i>A. tenebrosus</i> .. | <i>Filaria</i> , sp. .. | C. & J., 1911 (S.Q.) |
| 646 | <i>Grallina picata</i> .. | <i>a. Halteridium</i> , sp. .. <i>e. Echinorhynchus</i> , sp. | C. & J., 1911 (S.Q.) Jnstn., 1912 (N.Q.) |
| 647 | <i>Gymnorhina tibicen</i> .. | <i>d. Filaria</i> , spp. .. | Bancroft, 1890 (S.Q.), Johnston, 1910 (N.S.W.), C. & J., 1910 (N.S.W.), Gilruth, Sweet, and Dodd, 1910 (S.A.), Plimmer, 1912 (London Zoo.) |
| 650 | <i>G. leuconota</i> .. | <i>Filaria clelandi</i> (J.) .. <i>a. Hæmoproteus danielowskyi</i> <i>d. Filaria</i> , sp. .. | Jnstn., 1912 (N.Q.) Plimmer, 1912 (London Zoo.) Plimmer, 1912 (London Zoo.) |
| 654 | <i>Cracticus nigrigularis</i> | <i>Filaria</i> , sp. .. | C. & J., 1911 (S.Q.) |
| 658 | <i>C. destructor</i> .. | <i>Filaria</i> , sp. .. | Bancroft, 1890 (S.Q.), C. & J., 1911 (S.Q.) |
| 676 | <i>Pachycephala gilberti</i> | <i>e. Echinorhynchus pomatostomi</i> (J. & C.) | J. & C., 1911 (S.A.) |
| 689 | <i>Aphelocephala leucopsis</i> | <i>a. Halteridium</i> , sp. .. <i>e. Echinorhynchus pomatostomi</i> | C. & J., 1911 (S.A.) J. & C., 1911, Jnstn., 1910 (S.A.) |
| — | <i>Climacteris wellsi</i> .. | <i>E. pomatostomi</i> (J. & C.) | Jnstn., 1910, J. & C., 1911 (N.W.A.) |
| 712 | <i>Zosterops cerulescens</i> | <i>a. Halteridium</i> , sp. .. <i>b. Zosteropicola clelandi</i> (Jnstn.) | Jnstn., 1910, C. & J., 1910 (N.S.W.), C. & J., J., 1911 (S.Q., S.A.) Jnstn., 1912 (N.S.W.) |
| 733 | <i>Melithreptus atricapillus</i> | <i>a. Halteridium</i> , sp. .. | Jnstn., 1910, C. & J., 1910 (N.S.W.) |
| 745 | <i>Plectorhamphus lanceolatus</i> | <i>d. Filaria</i> , sp. .. | C. & J., 1911 (S.Q.) |
| 746 | <i>Myzomela sanguinolenta</i> | <i>a. Halteridium</i> , sp. .. <i>Leucocytozoon anellobiæ</i> (Jnstn.)* <i>d. Filaria</i> , sp. .. | C. & J., 1911 (S.Q.) C. & J., 1911 (S.Q.) C. & J., 1911 (S.Q.) |
| 761 | <i>Conopophila albicularis</i> | <i>b. Davainea conopophilæ</i> (Jnstn.) | Jnstn., 1912 (N.Q.) |
| 765 | <i>Stigmatops ocularis</i> .. | <i>d. Filaria</i> , sp. .. | C. & J., 1911 (S.Q.) |
| 769 | <i>Philotis fusca</i> .. | <i>a. Halteridium</i> , sp. .. | C. & J., 1911 (S.Q.) |

*The name *Leucocytozoon anellobiæ* is here given to an intra-corpuseular blood parasite found by Dr. Cleland and myself in several species of birds. We believe it to be a phase in the life-history of *Trypanosoma anellobiæ* (C. & J.) I have used the above name as possessing specific value. Should our opinion as to the specific identity of the two forms be correct, then the name *L. anellobiæ* becomes a synonym, or, to be more exact, it refers to a particular phase of *T. anellobiæ*.

| No. in Mathews' List. | Name of Host. | Name of Parasite. | Recorder and Locality. |
|-----------------------|-------------------------------------|--|---|
| 769 | <i>Ptilotis fusca</i> .. | <i>Trypanosoma anellobiæ</i> (C. & J.) <i>Leucocytozoon anellobiæ</i> , Jnstn.* <i>d. Filaria</i> , sp. .. | C. & J., 1911 (S.Q.) C. & J., 1911 (S.Q.) C. & J., 1911 (S.Q.), Plimmer, 1912 (London Zoo.) |
| 770 | <i>P. chrysotis</i> .. | <i>b. Choanotænia meliphagidarum</i> (Jnstn.) | Jnstn., 1910, 1911 (N.S.W.) |
| 772 | <i>P. sonora</i> .. | <i>a. Halteridium</i> , sp. .. | C. & J., 1911 (S.A.) |
| 775 | <i>P. chrysops</i> .. | <i>Halteridium</i> , sp. .. | C. & J., 1909 (N.S.W.) |
| 778 | <i>P. leucotis</i> .. | <i>b. Choanotænia meliphagidarum</i> (Jnstn.) | Jnstn., 1910, 1911 (N.S.W.) |
| 787 | <i>P. plumula</i> .. | <i>a. Halteridium</i> , sp. .. | Jnstn., 1910, C. & J., 1910 (S.W.A.) |
| 799 | <i>M. novæ-hollandiæ</i> .. | <i>a. Halteridium</i> , sp. .. <i>b. Choanotænia meliphagidarum</i> | C. & J., 1909 (N.S.W.) Jnstn., 1910, 1911 (N.S.W.) |
| 801 | <i>M. sericea</i> .. | <i>e. Echinorhynchus</i> , sp. <i>b. Choanotænia meliphagidarum</i> | Jnstn., 1910 (N.S.W.) Jnstn., 1910, 1911 (N.S.W.) |
| 804 | <i>Myzantha garrula</i> .. | <i>a. Halteridium</i> , sp. .. <i>Leucocytozoon anellobiæ</i> (Jnstn.) <i>d. Filaria</i> , sp. .. | C. & J., 1911 (S.Q.) C. & J., 1911 (S.Q.) Bancroft, 1890 (S.Q.), C. & J., 1911 (S.Q.) |
| 806 | <i>M. flavigula</i> .. | <i>a. Halteridium</i> , sp. .. | C. & J., 1911 (N.S.W.) |
| 808 | <i>Anthochæra carunculata</i> | <i>d. Ceratospira anthochæra</i> † (Jnstn.) | Kreffit, 1871, † Jnstn., 1912 (E.A.) |
| 810 | <i>Anellobia chrysoptera</i> | <i>a. Trypanosoma anellobiæ</i> (C. & J.) <i>Leucocytozoon anellobiæ</i> (Jnstn.) <i>d. Filaria</i> , spp. .. | Jnstn., 1910, C. & J., 1910, 1911 (S.Q.) C. & J., 1911 (S.Q.) Bancroft, 1890, Jnstn., 1910, C. & J., 1910 (S.Q.) |
| 812 | <i>Acanthogenys rufigularis</i> | <i>Filaria</i> , sp. .. | Jnstn., 1912 (N.S.W.) |
| 813 | <i>Entomyza cyanotis</i> .. | <i>a. Halteridium</i> , sp. .. <i>Trypanosoma anellobiæ</i> (C. & J.) <i>Leucocytozoon anellobiæ</i> (Jnstn.) <i>b. Davainea conopophila</i> (Jnstn.) <i>d. Filaria</i> , sp. .. | C. & J., 1911 (S.Q.) C. & J., 1911 (S.Q.) C. & J., 1911 (S.Q.) Jnstn., 1912 (N.Q.) Bancroft, 1890 (S.Q.), C. & J., 1911 (S.Q.), Plimmer, 1912 (London Zoo.) |
| 818 | <i>Tropidorhynchus corniculatus</i> | <i>a. Halteridium</i> , sp. .. | C. & J., 1909 (N.S.W.), 1911 (S.Q.) |
| 819 | <i>Philemon citreigularis</i> | <i>b. Davainea conopophila</i> (Jnstn.) <i>d. Filaria</i> , sp. .. | Jnstn., 1912 (N.Q.) Jnstn., 1912 (S.Q.) |

* See note on previous page.

† Recorded by Krefft as *Ascaris*, sp.

| No. in Mathews List. | Name of Host. | Name of Parasite. | Recorder and Locality. |
|----------------------------|---------------------------------------|--|--|
| 850 | <i>Oriolus sagittarius</i> .. | a. <i>Halteridium</i> , sp. .. <i>Trypanosoma anel- lobiæ</i> (C. & J.) <i>Leucocytozoon anel- lobiæ</i> (Jnstn.) d. <i>Filaria</i> , sp. | C. & J. (S.Q.) C. & J. (S.Q.) C. & J. (S.Q.) Bancroft, 1890 (S.Q.), C. & J., 1911 (S.Q.) |
| 852 | <i>Sphecothebes maxil- laris</i> | a. <i>Leucocytozoon anel- lobiæ</i> | C. & J., 1911 (S.Q.) |
| 854 | <i>Chibia bracteata</i> .. | d. <i>Filaria</i> , sp. | Bancroft, 1890 (S.Q.) |
| 861 | <i>Chlamydera maculata</i> | b. <i>Choanotænia chlamy- deræ</i> (Kreff) | Kreff, 1871, Jnstn., 1912 (E.A.) |
| 866 | <i>Sericulus chrysoceph- alus</i> | d. <i>Filaria</i> , sp. | Bancroft, 1890 (S.Q.) |
| 870 | <i>Craspedophora alberti</i> | b. <i>Biuterina clavulus</i> (Ln.) | Linstow, 1888 (N.Q.) |
| 872 | <i>Corvus coronoides</i> .. | <i>Davainea</i> , sp. | Jnstn., 1912 (N.S.W.) |
| 874 | <i>Corone australis</i> .. | d. <i>Filaria</i> , sp. | C. & J., 1911 (S.Q.) |
| 881 | <i>Strepera fuliginosa</i> .. | <i>Filaria</i> , sp. | Bancroft, 1890 (S.Q.), Johnston, 1910 (N.S.W.), C. & J., 1910 (N.S.W.) |
| 882 | <i>Struthidea cinerea</i> .. | <i>Filaria</i> , sp. | Plimmer, 1912 (Lon- don Zoo.) |
| 883 | <i>Corcorax melano- rhamphus</i> | a. <i>Leucocytozoon anel- lobiæ</i> d. <i>Filaria</i> , sp. | C. & J., 1911 (S.Q.) C. & J., 1911 (S.Q.) C. & J., 1911 (S.Q.) |

Plimmer (*J. R. Micr. Soc.*, 1912) refers to two other hosts, *Stoparola melanops* and *Estrela melpoda* as harbouring hæmatozoa, and as coming originally from Australia. According to the "British Museum Catalogue," the former is an Indian bird, while the latter belongs to West Africa. Plimmer quotes the locality of the latter bird as Australia (p. 141), and as West Africa (p. 147). They are not included in our list.

Birds of Lake Boga, Victoria.*

BY A. CHAS. STONE, R.A.O.U., MELBOURNE.

THE following observations were made during a residence of eighteen years in the Lake Boga district. When I first arrived no mallee scrub had been cut or rolled down, and the Murray flats were but sparsely populated. Since, the face of the country has been greatly changed.

Uroaetus audax. Wedge-tailed Eagle, "Nurrayil"—Some years ago, about 4 miles from Lake Boga, I took from an Eagle's eyrie two Eaglets like two big balls of white fluff. I carried them home in a

* The names in inverted commas are those of the Lake Boga tribe of aborigines. An interesting account of this almost defunct tribe (Gourni-janyuk, name, signifying "alongside edge of trees"), by Mr. Stone, appears in the *Proc. Roy. Soc. Victoria*, vol. xxiii. (N.S.), part ii. (1911).—Eds.

covered conveyance, the parent birds keeping me in sight the greater part of the way. Soon after dawn next morning the young ones commenced loud cries, and on investigating the reason I discovered the two old birds coming in the distance. Upon arrival they circled in the air at an altitude of, perhaps, half a mile, and this was repeated daily many times for nearly three weeks. In the course of time one Eaglet died, but the other grew into a fine bird. I kept it chained by the leg to a fence, but occasionally allowed it its freedom for an hour or two. On one occasion it knocked down and pecked an infant. I thereupon packed the bird into a crate and despatched it to Melbourne. About six months afterwards I was very much surprised to find that the Eagle had flown back to me. There was no doubt about it being the same bird—it allowed me to catch it, and the ring of wire was still around its leg.

Haliastur spheurnus. Whistling Eagle.—Not uncommon at Lake Boga. Maximum number of eggs to clutch, three.

Milvus affinis. Kite.—Not common. Maximum, three eggs.

Elanus scriptus. Letter-winged Kite.—Rarely seen.

Falco lunulatus. Little Falcon.—A pair of these birds, in 1908, nested on the top of the lift of the Swan Hill bridge. Maximum, three eggs.

Hieracidea orientalis. Brown Hawk, "Gercook." — Common. Maximum, four eggs.

Cerchneis cenchroides. Kestrel, "Karra Karrak." — Common. Maximum, five eggs.

Circus gouldi. Swamp Hawk, "Birr."—Very common. Have counted a score together. Maximum, four eggs.

Astur novæ-hollandiæ. White Goshawk.—Exceedingly rare.

Astur approximans. Goshawk.—Fairly common. Maximum, four eggs.

Accipiter cirrhocephalus. Sparrow-Hawk, "Yanuring." — Rare. In the Charlton district, years ago, I was staying at a friend's house, several of the doors of which opened on to a verandah. Chancing to open the dining-room door to see the time, I felt my hair disturbed by the flight of a bird past my head into the room, but before I had time to shut the door the bird flew out again. I saw it was a Sparrow-Hawk with a young Parrot in its talons, and closely pursued by the parent of the Parrot, which was so persistent in its attack that the Sparrow-Hawk sought refuge in another room, where it was caught; but by this time both Parrots had escaped.

Haliaetus leucogaster. White-bellied Sea-Eagle, "Gamerillock." — Rare.

Ninox boobook. Boobook Owl, "Wook Wook."—Rare.

Ninox strenua.* Powerful Owl, "Werrymull."—Very rare.

Strix flammea. Delicate Owl.—Uncommon.

Corvus coronoides. Crow.—Common.

Corone australis. Raven, "Waa."—Common. Feed with impunity upon poisoned animals. Maximum, five eggs.

* Possibly intended for *N. connivens* (Winking Owl).—EDS.

***Strepera cuneicaudata*.** Grey Crow-Shrike.—Very rare.

***Corcorax melanorhamphus*.** White-winged Chough (Black Jay), "Mounyougell."—A very mournful note. Very common in the mallee scrub. Maximum, six eggs.

***Grallina picata*.** Magpie-Lark, "Gerrin Gerrin."—Very common. Maximum, five eggs.

***Collyriocinela harmonica*.** Grey Shrike-Thrush, "Geiwoorn."—Very common. Maximum, four eggs.

***Graucalus melanops*.** Black-faced Cuckoo-Shrike. — Common. Maximum, three eggs.

***Lalage tricolor*.** White-shouldered Caterpillar-eater. — Common some seasons. Has a very pretty note. Nest, flimsy structure. When sitting bird will sometimes allow removal by hand. Maximum, three eggs.

***Microeca fascians*.** Brown Flycatcher. — Common. Maximum, three eggs.

***Petræca goodenovii*.** Red-capped Robin, "Jallegourk Gourk."—Very common. A favourite host of the Narrow-billed Bronze-Cuckoo. The nest is a beautiful specimen of bird architecture. Loves the scrub on borders of dry lakes. Maximum, three eggs.

***Petræca bicolor*.** Hooded Robin. — Common. Maximum, three eggs.

***Smicrornis brevirostris*.** Short-billed Tree-Tit.—Rare. In 1908 I found a nest of this species in which were three broken eggs of the Yellow-tailed Tit. On a close examination of the nest I discovered the Tit's eggs had been laid on a false lining which covered three broken eggs of the Short-billed Tree-Tit. Maximum, three eggs.

***Malurus melanotus*.** Black-backed Wren, "Yeerelell." — Not common. A beautiful bird. A favourite host of the Narrow-billed Bronze-Cuckoo. Maximum, four eggs.

***Malurus leucopterus*.** White-winged Wren.—Rare. In October, 1911, these birds were nesting in the large variegated thistles north of the lake. Maximum, three eggs.

***Rhipidura albiscapa*.** White-shafted Fantail.—Very rare.

***Rhipidura tricolor*.** Black-and-White Fantail, "Jerry Kerrick."—Very common. A graceful and confiding bird. Utters sweet notes sometimes on moonlight nights. Maximum, four eggs.

***Sisura inquieta*.** Restless Flycatcher.—I found a nest of this bird on a tea-tree, the nest being ornamented with coloured pieces of paper torn from an empty jam-tin. Every piece stuck on had the coloured side outwards. Maximum, three eggs.

***Acrocephalus australis*.** Reed-Warbler, "Garcoon Garcoon."—Very common. In 1893, in the willow trees at the north of Lake Boga were many nests, some of them nearly touching the water's surface. Maximum, four eggs.

***Chlamydodera maculata*.** Spotted Bower-Bird. — None observed since 1892.

***Megalurus gramineus*.** Grass-Bird.—Not common. I consider this bird one of the best of bird architects. In 1909 I found a splendid

specimen of workmanship in a lignum bush surrounded by swampy ground. The open nest was lined with the feathers of the Black-tailed Native-Hen, the tops of which formed a complete dome over the nest and covered the sitting bird. Maximum, three eggs.

Acanthiza uropygialis. Chestnut-rumped Tit.—Not uncommon at Lake Boga. Generally make their nests in the cracks of trees. A host for the Narrow-billed Bronze-Cuckoo. Maximum, four eggs.

Acanthiza chrysorrhoa. Yellow-rumped Tit.—Very common. Nest generally somewhat ragged, and with an upper chamber. Maximum, three eggs.

Acanthiza reguloides. Buff-rumped Tit.—Not uncommon. Maximum, four eggs.

Cinclosoma castanonotum. Chestnut-backed Ground-Thrush. — Rare. Maximum, two eggs

Drymaëdus brunneopygius. Scrub-Robin.—Very rare. Nests on ground at foot of wild hop-bush. Maximum, one egg.

Pomatorhinus temporalis. Babbler.—Rare. Maximum, three eggs.

Pomatorhinus superciliosus. White-browed Babbler. — Very common. Builds many more nests than are laid in. Maximum, four eggs.

Cinclorhamphus cruralis. Brown Song-Lark, "Gilpen Gilpen."—Very common, especially on the Murray flats in spring and summer. Maximum, four eggs.

Cinclorhamphus rufescens. Rufous Song-Lark. — Uncommon. Maximum, four eggs.

Ephthianura albifrons. White-fronted Bush-Chat.—Very common. Maximum, four eggs.

Ephthianura tricolor. Tricoloured Bush-Chat.—In 1906 and 1909 these beautiful birds came in great numbers from the interior, and nested in almost every available spot. Other years they are practically non-existent, as far as Lake Boga district is concerned. As with other birds that occasionally migrate from the interior, when they first arrive they are wonderfully tame. Maximum, four eggs.

Ephthianura aurifrons. Orange-fronted Bush-Chat.—I saw three pairs of these Bush-Chats in 1909, and about a dozen pairs in 1911. Maximum, three eggs.

Xerophila leucopsis. Whiteface.—Very common. A great enemy to insect life. Maximum, six eggs.

Gymnorhina tibicen. Black-backed Magpie, "Coorook."—Very common. Very inquisitive, and a great defender of its nest. In 1903 I found six eggs in one nest, but I have reason to believe they were laid by two birds. I am sorry to say I have seen these birds destroying Stubble Quail. Maximum, five eggs.

Gymnorhina leucanota. White-backed Magpie.—Rare.

Cracticus destructor. Butcher-Bird, "Garndoli."—Very common. A bird with a bad character. Maximum, five eggs.

Eopsaltria australis. Yellow Shrike-Robin.—Am doubtful of its occurrence, although I have a set of eggs (three) taken here which resemble those of this Robin.

Pachycephala rufiventris. Rufous-breasted Thickhead.—Common. Maximum, three eggs.

Pachycephala gilberti. Gilbert Thickhead.—Very rare. Maximum, three eggs.

Oreoica cristata. Bell-Bird. "Doon."—Not common. A flute-noted bird and ventriloquist. Maximum, three eggs.

Climacteris scandens. Brown Tree-creeper, "Been Been."—Very common. Note similar to the English Chaffinch. Maximum, three eggs.

Sittella pileata. Black-capped Tree-runner.—Not uncommon. Builds a beautiful nest, which is a perfect mimicry of its surroundings. Very suspicious, and I have known them make six several attempts to build a nest, to be forsaken in turn until the sixth time. Maximum, three eggs.

Plectrohynchus lanceolatus. Striped Honey-eater.—Very rare. Makes a beautiful nest almost solely of wool. Maximum, three eggs.

Meliphaga phrygia. Warty-faced Honey-eater.—Rare. Maximum, three eggs.

Ptilotis penicillata. White-plumed Honey-eater.—Very common. Maximum, three eggs.

Myzantha garrula. Noisy Miner, "Brindeng."—Maximum, four eggs.

Acanthochæra rufigularis. Spiny-cheeked Honey-eater.—Common. Maximum, three eggs.

Philemon corniculatus. Leatherhead, "Churru Churru carthi."—Rare. Maximum, three eggs.

Dicæum hirundinaceum. Mistletoe-Bird.—Very rare.

Pardalotus ornatus. Red-tipped Diamond-Bird.—Common. Maximum, four eggs.

Pardalotus punctatus. Spotted Diamond-Bird.—Maximum, four eggs.

Hirundo neoxena. Swallow, "Weetch Weetch Murrumbool."—Very common. In 1894 I saw one of this species cream-coloured, accompanied by a score or more of normal-coloured ones. Maximum, five eggs.

Cheramœca leucosternum. Black-and-White Swallow.—Very rare. Maximum, five eggs.

Petrochelidon nigricans. Tree-Martin.—Common. Maximum, five eggs.

Petrochelidon ariel. Bottle-Swallow or Fairy Martin.—Common. Maximum, six eggs.

Anthus australis. Ground-Lark.—Very common. Maximum, four eggs.

Artamus leucogaster. White-rumped Wood-Swallow.—Rare. Maximum, four eggs.

Artamus superciliosus. White-browed Wood-Swallow.—Very common. Maximum, three eggs.

Artamus personatus. Masked Wood-Swallow.—Very common sometimes. Maximum, three eggs.

Artamus sordidus. Wood-Swallow.—Very common. Maximum, four eggs.

Taniopygia castanotis. Chestnut-eared Finch.—Common sometimes, when it nests practically anywhere. I found two nests of young in April, 1906. Maximum, six eggs.

Mirafra horsfieldi. Bush-Lark.—Not common. Nested freely in 1909. Maximum, four eggs.

Chætura caudacuta. Spine-tailed Swift, "Marder."—Noticed more in stormy weather during summer.

Eurostopus argus. Spotted Nightjar.—Very rare. Lays its one egg on the bare ground. Maximum, one egg.

Podargus strigoides. Tawny Frogmouth, "Genykenitch."—Common. The position it takes up is perfect in its mimicry of a broken branch. Maximum, three eggs.

Ægotheles novæ-hollandiæ. Little Nightjar, "Yerradedgourk."—Very common. Maximum, three eggs.

Merops ornatus. Bee-eater, "Berrembert."—Another beautiful bird, which arrives in November and very soon commences burrowing out a nesting-site in the sand wherein to deposit its eggs. Maximum, five eggs.

Dacelo gigas. Laughing Kingfisher, "Gorrum Gorrum."—Not common. Maximum, three eggs.

Halcyon sanctus. Sacred Kingfisher.—Common in particular localities. Mr. D. Young, a Lake Boga farmer, had his large mud-brick buildings pierced in many places to a depth of several inches by these birds, which were in the locality in numbers in 1909. So great a nuisance did the birds become that rabbit traps were set on boxes to catch them as they entered the tunnels. Maximum, five eggs.

Cacomantis flabelliformis. Fan-tailed Cuckoo.—Rare.

Cacomantis variolosus. Square-tailed Cuckoo.—Very rare

Chalcococcyx basalis. Narrow-billed Bronze-Cuckoo.—Common in the mallee fringe.

Trichoglossus novæ-hollandiæ. Blue Mountain Lorikeet.—Very rare.

Cacatua galerita. White Cockatoo, "Geenup."—Very common at times.

Cacatua leadbeateri. Pink Cockatoo, "Kathukcun."—Getting exceedingly scarce, going north and west further each year. Maximum, four eggs.

Cacatua roseicapilla. Rose-breasted Cockatoo, "Willick Willick."—Very common. Two or three hundred of these birds wheeling suddenly in flight with wonderful precision, their rose-coloured breasts coming suddenly into view simultaneously, and then as suddenly dissolving into a mass of grey, and the sun shining all the time, is a sight well worth seeing. Maximum, six eggs.

Licmetis nasica. Long-billed Cockatoo, "Gallalie."—Very rare.

Calopsittacus novæ-hollandiæ. Cockatoo-Parrakeet, "Wourep."—Very common at times. A perfect bird pet, and breeds freely in captivity; one of the best of mimics. Maximum, eight eggs.

Polytelis melanura. Black-tailed Parrakeet, "Gooren Gooren."—As with the Cockatoos, the trappers are making this fine bird very scarce. Maximum, six eggs.

Platycercus eximius. Rosella, "Gourk Kallee."—Common along the course of the Murray River. Maximum, nine eggs.

Barnardius barnardi. Mallee-Parrakeet, "Lumm."—Common, and generally becomes vindictive when caged. Maximum, five eggs.

Psephotus xanthorrhous. Yellow-vented Parrakeet, "Billingurry."—Very common. Maximum, eight eggs.

Psephotus hæmatonotus. Red-backed Parrakeet, "Geechurt."—Very common. Maximum, eight eggs.

Melopsittacus undulatus. Warbling Grass-Parrakeet, "Tootther."—Some years—for instance, in 1909—these little Parrots came in countless numbers. I saw one a pure yellow. Any hollow log or spout or knot-hole will do for the nesting-place. Maximum, nine eggs.

Geopelia cuneata. Little Dove.—Very rare now; plentiful in 1892; Maximum, two eggs.

Phaps chalcoptera. Bronze-winged Pigeon, "Dapt."—Very common. Have seen hundreds together feeding near wild hop-bushes. Have found nests in April, 1910. Maximum, two eggs.

Ocyphaps lophotes. Crested Pigeon, "Nungoore."—Common. Will breed in aviaries. Maximum, two eggs.

Coturnix pectoralis. Stubble Quail, "Geichallert."—Very common some seasons. Interesting birds in captivity. Old birds will mother young birds (strange) in an aviary. I have seen them flying across the Murray packed in a dense mass—perhaps 300 of them. One afternoon, with dog and gun, when after this fine game-bird, during the season of 1906, I witnessed a singular occurrence. I had been ranging the flats contiguous to the Little Murray River during the afternoon with but indifferent success, and was walking along the river-bank at 5.30 p.m., when my attention was attracted by what at first sight seemed a balloon coming low down over the river. Closer scrutiny revealed it to be a densely-packed mass of Stubble Quail. It was 3 or 4 yards wide and the same high, and contained hundreds of birds. They were followed by a similar mass distant about 50 yards. Both masses settled at the bank, and immediately dispersed in different directions. I first noticed them 150 yards away, and by the time I had traversed 100 yards I was getting so much shooting that my gun was hot, my aim erratic, and the scent so bewildering to my pointer that he simply came "to heel," and refused to budge. As I have never had an experience of this nature before, I should like to know if other shooters have. Maximum, ten eggs.

Lipoa ocellata. Mallee-Fowl, "Lowan."—Getting very scarce as the opening of the Mallee proceeds. Maximum, eighteen eggs.

Turnix varia. Painted Quail.—Very rare.

Turnix velox. Little Quail, "Bourongi."—In 1904 they came in countless numbers and nested freely. Since that year very few have been observed by me. Maximum, four eggs.

Pedionomus torquatus. Plain Wanderer.—Very rare. Two nests observed in 1909: Maximum, four eggs.

Hypotænidia philippinensis. Pectoral Rail, "Lerrup."—Not common. Maximum, twelve eggs.

Porzana palustris. Little Crake, "Tillip."—Rare. Maximum, six eggs.

Microtribonyx ventralis. Black-tailed Native-Hen, "Dallip."—Often very common. In September, 1909, they appeared in great flocks, frequenting every water-hole and nesting very freely, afterwards disappearing as suddenly as they came. Maximum, seven eggs.

Porphyrio melanonotus. Bald-Coot "Beenbing."—Very common. This bird is terribly destructive to the eggs of the Black Swan. If for any reason the Swans are disturbed whilst nesting, the Coot is generally first back at the nest, and works havoc amongst the eggs by breaking the shell and partly devouring the contents. Maximum, eight eggs.

Fulica australis. Black Coot, "Tdaich."—Very common. I have seen these birds feeding on the soft young grass round the lakes in thousands. I one day picked up a Coot after the swoop of a Little Falcon, and found it completely scalped. Maximum, nine eggs.

Antigone australasiana. Native Companion, "Gootthun."—Very common during seeding time. Maximum, two eggs.

Eupodotis australis. Wild Turkey (Bustard), "Gnarrow."—Once very common. I have seen over 30 together, but now, owing to the fox, and especially to the poisoned wheat and pollard, they are very rarely seen, and I am sorry to think that, certainly as far as Victoria is concerned, they will soon be non-existent. Maximum two eggs.

Burhinus gallarius. Stone-Plover, "Will"—Not common. Maximum, two eggs.

Erythrogonys cinctus. Red-kneed Dottrel.—Rare. In October, 1909, they took advantage of the flooded country round Fish Point, and nested freely along the check-banks. Maximum, four eggs.

Lobivanellus lobatus. Spur-winged Plover, "Barretch Barretch."—Very common. Maximum, four eggs.

Zonifer tricolor. Black-breasted Plover, "Munyragurk."—Very common. A great dissembler. Maximum, four eggs.

Ægialitis ruficapilla. Red-capped Dottrel.—Common. Maximum, two eggs.

Ægialitis melanops. Black-fronted Dottrel, "Bert Bert Nalluk."—Very common. Maximum, three eggs.

Himantopus leucocephalus. White-headed Stilt, "Kercumbul."—In October, 1909, there were thousands nesting along the check-banks of the flooded area of Fish Point. When disturbed they do a lot of hopping in the shallow waters. Their cry resembles a puppy's bark. Maximum, four eggs.

Recurvirostra novæ-hollandiæ. Red-necked Avocet.—Very rare, but in 1909 I saw 16 pairs together, and they nested freely. Maximum, four eggs.

Heteropygia acuminata. Sharp-tailed Stint.—Very common; sometimes in thousands on the sand-spits.

Gallinago australis. Snipe.—Common at times. Dr. Mitchell, late of Swan Hill, once found a fully developed egg in a bird he dissected.

Rostratula australis. Painted Snipe.—Rare. Maximum, four eggs.

Hydrochelidon hybrida. Marsh Tern, "Garwit."—Very common. In December, 1910, I visited a rookery of Marsh Terns in the morass at Sale, when I was surprised at the numbers. They were there in thousands, and nesting within a few feet of one another. The nests were made of water-weeds, and the egg cavity lined with the stalks only. A set of eggs consisted of three invariably, but in no instance did I notice three young. In every instance one egg proved unfertile. The nestlings' food consisted of young fish from 1 to 2 inches long. A constant flight of Terns, going and returning to their hungry youngsters, continued from daylight until dark.

Gelochelidon anglica. Gull-billed Tern.—Not common.

Larus novæ-hollandiæ. Silver Gull, "Barpethen."—Very common. These birds nested on the check-banks at Fish Point in hundreds. The nests contained from one to three during November, 1909. Distance from the ocean, 206 miles.

Ibis molucca. White Ibis, "Cukcuk."—Very common. Maximum, five eggs.

Carphibis spinicollis. Straw-necked Ibis, "Gnargourelle."—Very common. Maximum, five eggs.

Plegadis falcinellus. Glossy Ibis.—Rare.

Platalea regia. Black-billed Spoonbill, "Naangourelle."—Very rare. Maximum, two eggs.

Platibis flavipes. Yellow-billed Spoonbill, "Toop Toop."—Rare now. Maximum, four eggs.

Mesophoyx plumifera. Plumed Egret, "Cathupbee Mununderra."—Owing to the cruel craze for "Osprey" plumes, this is a bird with a "past" and but little future. Maximum, four eggs.

Herodias timoriensis. White Egret.—Once a familiar object, but fast disappearing.

Notophoyx novæ-hollandiæ. White-fronted Heron, "Carthinbung."—Common. Maximum, five eggs.

Notophoyx pacifica. White-necked Heron, "Waan."—Common. Maximum, six eggs.

Nycticorax caledonicus. Night-Heron, "Yapulyapitch."—Not common. Maximum, four eggs.

Botaurus poeciloptilus. Bittern, "Coweer."—Not uncommon. There is an idea current that the Australian aborigines attributed the booming of the Bittern to the mythical "bunyip"; but this is utterly wrong, as the aborigines were past masters in the ways of Australian birds, beasts, and fishes. Maximum, five eggs.

Phalacrocorax carbo. Black Cormorant, "Murtmurrel."—Common.

Phalacrocorax sulcirostris. Little Black Cormorant, "Walla-walluk."—Common. Maximum, four eggs.

Phalacrocorax gouldi. White-breasted Cormorant.—Common.

Phalacrocorax hypoleucus. Pied Cormorant.—Rare.

Phalacrocorax melanoleucus. Little Cormorant, "Boourp."—Common. Maximum, five eggs.

Plotus novæ-hollandiæ. Darter, "Gercarthin."—Now very rare. Maximum, four eggs.

Pelecanus conspicillatus. Pelican, "Nynungourk."—Very common. I have seen these showy birds massed in scores, following a shoal of small fish, and levying a very heavy toll thereon.

Podiceps novæ-hollandiæ. Black-throated Grebe. — Rare. Maximum, nine eggs.

Podiceps poliocephalus. Hoary-headed Grebe, "Gorrower."—Very common. In 1910 I saw hundreds of their nests in a morass near Sale, and for some reason they were nearly all forsaken. It may be that the close proximity of the Marsh Tern rookery disturbed them too much. They are thick at times on Lake Boga. Maximum, nine eggs.

Podiceps cristatus. Crested Grebe, "Gorrwong."—Common at times. In 1907, during February, they nested by the score on the water-weeds at Long Lake. The egg when first laid is a very pale greenish-white, but is soon stained, and becomes a rich brown. Maximum, six eggs.

Chenopsis atrata. Black Swan, "Coonnoar."—Very common. Maximum, seven eggs.

Anseranas semipalmata. Pied Goose, "Gnak."—Very rare. In 1892 hundreds of these Geese could be seen at any time with very little trouble. I saw 15 shot with 3 barrels of a 12-bore.

Chenonetta jubata. Maned Goose, "Nannuck."—Common.

Casarca tadornoides. Mountain-Duck, "Gnarcoondull."—Common.

Anas superciliosa. Black Duck, "Nyree."—Common. I have an abnormal set of eight of these eggs no larger than Teals', but undoubtedly Black Ducks'. Maximum, fifteen eggs.

Nettion gibberifrons. Grey Teal, "Binnar."—Very common. Maximum, fourteen eggs.

Spatula rhynchotis. Blue-winged Duck, "Weetchut."—Very common. I think these Ducks are the most suspicious of the presence of possible danger. Maximum, twelve eggs.

Malacorhynchus membranaceus. Pink-eared Duck, "Gewallert."—Very common.

Stictonetta nævosa. Freckled Duck, "Gnall Gnall."—Uncommon.

Nyroca australis. White-eyed Duck, "Garrut."—Very common. Maximum, fourteen eggs.

Erismatura australis. Blue-billed Duck.—Uncommon. These birds are often caught in fishermen's nets, and, of course, get drowned.

Biziura lobata. Musk-Duck, "Goolwil."—Sometimes these birds can be seen together in hundreds, and when startled the noise of their rushing through the water reminds one of the noise of a train in motion. At such times they extend in a long line. Maximum, four eggs.

Dromæus novæ-hollandiæ. Emu, "Goweer."—During the 1902 drought many of these noble birds crossed the River Murray into Victoria.

NOTE.—On 21st October, 1909, at Lake Boga; a lad brought me a clutch of four eggs which he had found in a nest on a branch of

native tobacco bordering the shore of Round Lake. He described the bird as one he had never seen before—black and beautiful yellow—and his statement was corroborated by his father and one other, as in all three sets were taken, each of four eggs. The eggs are smaller, but resemble those of *Eopsaltria australis* (Yellow Robin). The ground colour is medium dark green, and closely freckled and blotched with ash-brown.

Field Ornithology in South Australia.

By (CAPT.) S. A. WHITE, M.B.O.U., R.A.O.U., ADELAIDE.

PORT AUGUSTA DISTRICT.

ON 3rd October, 1911, my wife and I made a start by the early morning train for Port Augusta, and, after a long and weary journey, reached that north-western town at a late hour the same night. Having interviewed Dr. Riddell and my transport man, I retired to rest. Next day the transport man made all kinds of objections in regard to supplying us with a team for travelling outback. The principal one was that, owing to the dryness of the season (there was no doubt that the country at that time was suffering from drought), neither horses nor mules could live on the country, and it was impossible to carry enough fodder for an extended trip. Anyhow, we made a start that day towards the Gawler Ranges. After leaving Port Augusta West, with its low corrugated iron houses, half-buried in the sand, we travelled north-west. Beyond the first sandy ridge a small flock of Wood-Swallows attracted our attention. They proved to be *Artamus melanops*. This species was discovered by my late father on his memorable trip into the interior, which was then an unknown country, the first skin being secured on 23rd August, 1863, at St. a'Beckett's Pool, lat. 28° 30'. It was from this skin that Gould described the species in his great work on the birds of Australia (Supplement, part v.) The notes of these birds resembled those of other members of the genus; their habits and flight were also similar.

Our track took us close to Lake Dempsey. We were greatly astonished to see so many Black Swans (*Chenopsis atrata*) upon this small salt lake. We were afterwards informed that there are always great numbers of these birds here. Moving on, we passed over miles of drifting sand, till we entered upon the salt-bush country, which appeared parched as a result of the continuous dry weather. Camping that night near a dam which contained a little red-coloured water, we pitched our tent between two myall trees. Next morning we were up early, and walked down to the dam to watch the birds come in to drink. It was an interesting sight. A great flock of Warbling Grass-Parrakeets (*Melopsittacus undulatus*) swept round in a circle several times, making the air vibrate with the swift movement of their wings. The rich green and yellow of their plumage was displayed to perfection as they

wheeled and turned in the morning sunlight before they settled down on the wet mud close to the water. Having drunk, they rose with one accord and flew off to their feeding-ground. Next a large flock of Cockatoo-Parrakeets (*Calopsittacus novæ-hollandiæ*) put in an appearance. They, too, circled over the water several times before alighting. A dead myall tree stood some little distance from the dam, and its branches were hidden by the birds. They flew down, a dozen or more at a time, till all had satisfied their thirst, when they flew away towards the north-east in a flock. Before they had gone the Crested Pigeons (*Ocyphaps lophotes*) had arrived for their morning drink. These birds did



Camp in Salt-bush Country.

FROM A PHOTO. BY S. A. WHITE.

not fly up in a flock, but came in from the salt-bush plains in one long line, two or three abreast; and, instead of flying straight down to the water's edge, they alighted some distance away, running up to the dam and down to the water very quickly. The male birds paused now and again, pouted their lovely throats, and uttered a deep cooing note. Specimens procured some distance from water had a tablespoonful or more of that liquid in their throats. Possibly they were conveying it to their mates which were brooding.

The country over which our track passed for many miles was open salt-bush plain, undulating in places, with patches of myall and sandalwood. Strangely formed hills rose abruptly out of

the plain here and there, but they were only isolated blocks. It was round one of these, called "Tent Hill," that we put in most of our work. We found the Crimson-bellied Parrakeet (*Psephotus hæmatorrhous*) plentiful in the clumps of low timber during the heat of the day (and it can be hot in this country). They were amid the thick foliage of the myall trees, where they often perched motionless, without uttering a sound, for hours, coming out to feed in the late afternoon and in the early morning, when they made up for lost time. In company with this species we often found the Many-coloured Parrakeet (*P. multicolor*). Of *Ephthianura* we found three species rather plentiful. On several occasions we saw *E. albifrons* and *E. aurifrons* mingling in large flocks, there being many immature birds amongst them. These two species were found invariably out on the open plains, but the Tricoloured Chat (*E. tricolor*) showed a strong liking for open timbered country, and when pursued would not leave the myall scrub for any length of time. The males, when adorned in their beautiful scarlet livery, seemed conscious that they were conspicuous, and were difficult to approach.

We found two species of Wrens in the salt-bush. The White-winged Wren (*Malurus leucopterus*) was plentiful; each day we saw one or two small parties hopping about among the low bushes. The Purple-backed Wren (*M. assimilis*) was not nearly so plentiful. We saw very few, and there seemed to be many more females and immature males than mature males than was the case with the former species. Hawks were not numerous, owing, no doubt, to the drought. A few specimens of the Wedge-tailed Eagle (*Uroæetus audax*) were observed in the north-west. The Little Eagle (*Nisæetus morphnoides*) was seen on several occasions. On 6th October, 1911, we found two nests of the Little Eagle. One was built in a leaning myall tree about 15 feet from the ground; it was composed of large sticks, and contained two white eggs bearing a few faint markings and almost round in shape. The second nest also was placed in a myall, about 20 feet from the earth, and contained one young bird covered in thick white down. It had been recently fed upon small particles of rabbit-flesh. A few days later we located another nest, which was about 40 feet above the ground. As we approached the tree the parent bird flew off the nest, which contained one young bird covered in a thick, soft down. About this time we found a nest of the Brown Hawk (*Hieracidea berigora*), containing two large fledglings clad in down of a dirty yellow colour. The pin feathers were just developing in wings and tail.

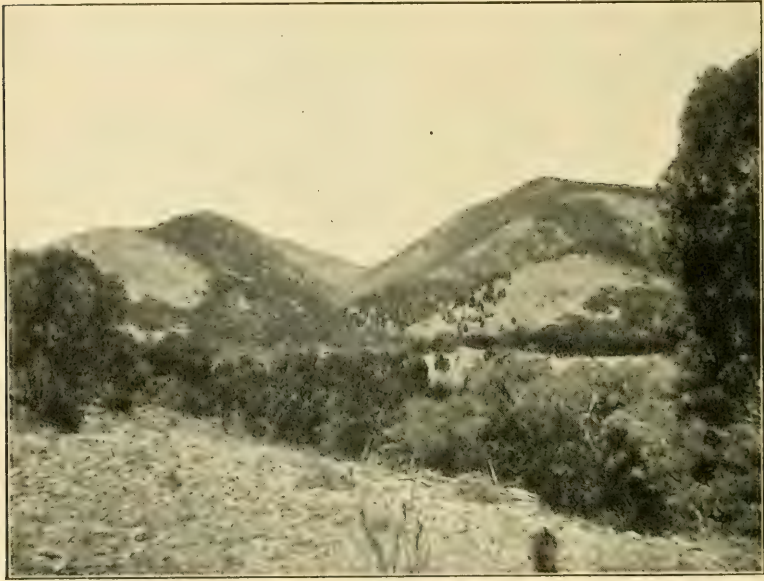
During our journey over the everlasting salt-bush we met with a *Calamanthus* of a very rufous-brown colour. (On comparing this bird after our return, we found it to be identical with a skin collected by Dr. Morgan at Mt. Gunson, now in the Adelaide Museum, and labelled *C. campestris*. Should this be correct,

the *Calamanthus* collected during our last trip on Eyre Peninsula was certainly not *C. campestris*.) * These birds were very shy, and passed from bush to bush as quickly as mice. Their plumage harmonized with their surroundings so closely that it was very difficult to detect them when still. The Rufous-vented Shrike-Thrush (*Collyriocincla rufiventris*) was met with, but not in numbers. We discovered a nest with the female bird on it. She sat very closely, and almost allowed herself to be touched by the hand before she flew off. The nest was neatly built of sticks, lined with rootlets and strips of bark; it contained one fresh egg, and was situated in a myall tree, about 15 feet from the ground. On one occasion we came upon a small party of White-shouldered Caterpillar-eaters (*Lalage tricolor*) in a clump of myall trees which were in flower. The birds seemed to be feeding upon some species of winged insects which had been attracted by the blossoms. The Bell-Birds (*Oreoica cristata*) were fairly numerous, and their clear, liquid calls were pleasant to hear. We found a nest in an old Babbler's (*Pomatorhinus superciliosus*) nest one evening just at dusk, in a myall tree. The old nest appeared weather-beaten and torn; but the tail of a bird was protruding over the side, and attracted our attention. A brown bird darted off and came to the ground, where it hopped about. We mistook it for a Thrush before examining the eggs, which were two in number. Next morning we paid this nest another visit, and found the *Oreoica*'s nest inside the old one. It contained a great number of hairy caterpillars, as usual. Two species of Wood-Swallows (*Artamus melanops* and *A. superciliosus*) were found nesting. Many nests containing eggs or young were observed. The birds had a great liking for the large bunches of mistletoe which hung from the myall trees as nesting-sites. Although we did not see any mistletoe in fruit, we saw several Mistletoe-Birds (*Dicaeum hirundinaceum*). Yellow-throated Miners (*Myzantha flavigula*) were very plentiful in places. We saw many nests which contained from two to four eggs, varying much in markings and colouration. The White-browed Babbler (*Pomatorhinus superciliosus*) was common throughout this country. The Red-capped Robin (*Petræca goodenovii*) was sparingly dispersed. The Freckled Frogmouth (*Podargus strigoides*) was also met with.

One of the commonest and most widely distributed birds which we met with on our trip was the Whiteface (*Xerophila leucopsis*). They were everywhere, and their little clucking note was heard from daylight till dark. They were ever on the move, on the ground hopping about in a great hurry, or in the low bushes peering under every leaf and twig. They seemed to be a great enemy of all insect life. Cuckoos were not numerous. Only a few specimens of the Narrow-billed Bronze-Cuckoo (*Chalcococcyx basalis*) came under our notice, and these seemed to be following the *Xerophilas* around—an attention which was strongly resented. Wherever there was a patch of scrub the noisy Spiny-cheeked Honey-eater (*Acanthogenys rufigularis*) was to be found. Many

of their notes were very pleasing to the ear, liquid and gurgling, like the sound of running or falling water. These Honey-eaters were very pugnacious; two or three males were often seen in fierce conflict. The Butcher-Bird (*Cracticus destructor*) was met with in pairs. Ravens (*Corone australis*) were seen each day. They were very cunning, and seemed to recognize a gun at sight, as well as a human being. Directly we struck camp and moved on numbers of Ravens would assemble and fight over the morsels left behind.

We moved on slowly till a very severe heat wave came up from the Australian Bight, drying up water and feed. This was fol-



Part of Flinders Range.

FROM A PHOTO. BY S. A. WHITE.

lowed by a two days' sand storm. The wind blew with great violence, sweeping over the open plains with nothing to check it. The eyelet-holes were torn out of the tent, and there was nothing for it but to lie down and roll up in the tent fly. Everything was covered inches deep in a red sandy loam. When we did manage to light a fire it was blown away. The wind slackened at sunset each day, but next morning became violent again. We were compelled to return to Port Augusta, feeling very disappointed, for we had hoped to get into the Gawler Ranges. Had our transport man pushed on with a good team this might have been accomplished.

After a day in Port Augusta we made arrangements with

another man to supply transport, and early one morning struck out to the north-east, following the foothills of the Flinders Range. We passed many well-wooded creeks (in which water flows during good seasons), the beds of which were as dry as the surrounding country. Our transport man pointed out many of Dr. Chenery's old collecting-grounds. Having followed the Flinders Range for some distance, collecting as we went, we struck into the range by means of one of the many deep ravines, and formed a permanent camp. The creeks had dried up, but by digging in the gravel-bed water was obtained for the party and horses. We pitched our tent on the ridge of a small spur leading to the main range. The scenery in many places was very beautiful. A picture presented itself every morning in front of our tent. Range upon range swept away to the north, clothed in vegetation. The tops of red gums growing in the creek near by were all shades of light green and yellow. Many of the slopes were covered in the rich dark foliage of the native pine, patches of mallee, and dark sheoaks. Each night we were camped in this locality the wind blew with great violence, and we had to pile great stones around the tent to keep it from blowing inside out. Fortunately, there was no sand, and the rough masses of ironstone defied the winds to shift them.

Many deep ravines or gorges pierced the sides of the range from the west, and it was close to one of these that our main camp was situated. Our first excursion was up the gorge, along the bed of a creek whose course was marked far out upon the plain by fine old red gum trees. These trees also followed the course of the creek for some little distance into the range, gradually becoming more dwarfed. Here and there between the huge masses of rocks small shrubs found a hold. We found a bush or two of the quandong, or native peach—the variety which bears a fruit with a smooth stone. Far up on the mountain-sides native pines could be seen. At the mouth of the gorge we saw a Great Brown Kingfisher (*Dacelo gigas*)—the only specimen observed on the trip. This Kingfisher and one or two White-plumed Honey-eaters (*Ptilotis penicillata*),* which were of a very light colour, were the only birds seen or heard in this deep cleft of the mountains. We climbed on, in hopes of seeing some more bird-life, over huge boulders and masses of rock, dead timber, and *débris*. We passed several rock-holes full of clear water, but not a bird was to be seen or heard. After a great deal of hard climbing we issued from the gorge on to a steep ridge. There were some stunted pines growing on the slopes. Here we saw the Grey Shrike-Thrush (*Collyriocincla harmonica*), also the Brown-headed Honey-eater (*Melithreptus brevirostris*). It was with the greatest difficulty that we made our way to the foot of the range, and many times we wished that we had gone back along the creek. After reaching the foothills we came upon a patch of the

* *P. rosinae*, Mathews' "Reference-List," p. 412.

tobacco plant (*Nicotiana glauca*), and among the yellow flowers observed a number of Plumed Honey-eaters (*Ptilotis plumula*).^{*} Their flight was swift but irregular—a series of spasmodic darts.

At the entrance to one of the gorges we met with a party of Adelaide Parrakeets (*Platycercus adelaidæ*).[†] They were among the large gums on the banks of the creek, and the stomachs of specimens secured contained great quantities of gum seeds. This was a furthest north record, I considered, for the species, and the plumage of the birds appeared to be many shades lighter than that of specimens observed in the Mount Lofty Ranges. Their notes and habits, as far as we could see, were identical with those of birds found further south. They did not appear to be at all plentiful. On the other hand, we met with great numbers of the Barnard Parrakeet (*Barnardius barnardi*).[‡] We first saw them on the foothills of the range, along the creeks, where they emptied out upon the plain—just an odd pair or two; but on our advancing into the range they became more and more plentiful. We often surprised a small party feeding upon the ground. They would rise with much fuss, but, up to the time of alarming them, there was no intimation of their presence. Where the introduced tobacco plant (*Nicotiana glauca*) flourished, its seeds seemed to form their chief food. Amidst the thick bush that grew on the sides of the hills the Rufous-breasted Thickhead (*Pachycephala rufiventris*) was fairly plentiful. The White-throated Thickhead (*P. gutturalis*)[§] was also seen occasionally. One bird, which I thought, from a distance, had an unusually broad pectoral band, led me a great chase, moving from one locality to another. At last it flew to the far side of a deep ravine, where it was safe.

About two or three miles from our camp was a steep, round-topped hill, its crown and part of the western side covered in spinifex. Lower down a small shrub (salt-bush) grew thickly, and among this were two very interesting birds. One was the Red-throat (*Sericornis brunnea*). It was very shy, and once lost in the low bush hard to see again. When not alarmed or suspicious of danger their movements were quick, but elegant. They passed over open spaces between the bushes very much after the manner of Blue Wrens, often carrying their tails erect. The male would often mount to the top of a bush and pour forth a short but pleasing song. At the breaking of a twig or the sight of an enemy they were off in a flash, passing along the ground like mice from bush to bush. But, despite this timidity, their curiosity was at times stronger, and they could invariably be called out of hiding by our imitating the feeble call of a wounded bird. They seemed to be fairly plentiful on the sides of the ranges, about 400 to 500 feet, but we did not meet with them out on the salt and blue-bush plains. The other bird

^{*} *P. ethelæ*, Mathews' "Reference-List," p. 410.

[†] *P. sub-adelaidæ*, Mathews' "Reference-List," p. 270.

[‡] *P. whitei*, Mathews' "Reference-List," p. 273.

[§] ? *P. meridionalis*, North.—Eds.

which inhabited the same class of country was the Purple-backed Wren (*Malurus assimilis*). These pleasing little birds were in small companies amid the salt-bush-like shrubs; one or two adult males, several immature males, and five or six females comprised the company. Like all members of the genus, they were almost always on the move, searching every twig and going round and round a bush till it was thoroughly examined, then passing over the open space to another. I watched a female dislodge a brown spider from a dead bough which was lying out on an open space. She drew herself up till her thin legs looked abnormally long, and with leaps in the air made blows with her beak at the spider till she had disabled it, when it was carried off to cover, to be devoured in comfort. The males are very pugnacious; I saw two clutch each other with their little claws and roll over and over in the dust in frenzied combat. We saw and heard a *Strepera* in the distance, but were unable to procure a specimen for identification. Dr. A. M. Morgan, who did good work in this country a few years ago, could not procure a specimen, although he tried hard.

Passing through a thick clump of mallee one day, we alarmed a Boobook Owl (*Ninox boobook*). This was the only Owl we saw upon the trip. As far as I could see, it showed no variation in size or colour. Amidst the range the soft cooing of the Peaceful Dove (*Geopelia tranquilla*) was frequently heard, and these trustful little birds perched close to us. Where the mistletoe fruit showed signs of ripening we always observed the Mistletoe-Birds (*Dicaeum hirundinaceum*). Their sharp call could never be mistaken. With so much big timber about we expected Pardalotes to be numerous, but this was not the case, for we saw only a few specimens of *Pardalotus ornatus*. Tracing one or two of the big-timber creeks where they lost themselves out on the plains, we found that a number of Ravens (*Corone australis*) were still nesting in the high gums, in company with other birds. The Whistling Eagle (*Haliastur sphenurus*) was also nesting. Most of the nests contained young birds. In this locality we saw a pair of Black Falcons (*Falco subniger*). We spent much time in searching for the nest, but failed to find it. Along the foothills and down their creeks we met with the Yellow-throated Miner (*Myzantha flavigula*). Some were nesting in the tall red gums. One nest, composed entirely of wool, was suspended from a hanging bough in a very big gum, 60 feet from the ground, and contained four fresh eggs. The Brown-headed Honey-eater (*Melithreptus brevirostris*) was the commonest bird in the ranges. It was travelling about in parties of from 12 to 30. The Brown Tree-creeper (*Climacteris scandens*) was met with among the hills, but was not numerous. While camped in the ranges we heard the Stone-Plover (*Burhinus grallarius*) at night.

After working out the district, we moved down from the range and made our way across to a piece of country which was once the home of the Night-Parrakeet (*Geopsittacus occidentalis*). We

spent some time in beating, but it was only too clear that this rare bird had left the locality for ever, and that we must look for it much further to the west. We met with the Black-breasted Plover (*Zonifer tricolor*), Nankeen Kestrel (*Cerchneis cenchroides*), Magpie-Lark (*Grallina picata*), Purple-crowned Lorikeet (*Glossopsittacus porphyriocephalus*), Black-faced Cuckoo-Shrike (*Graucalus melanops*), Black-and-White Swallow (*Cheramæca leucosternum*), Ground-Lark (*Anthus australis*), Red-backed Kingfisher (*Halcyon pyrrhopygius*), Tree-Martin (*Petrochelidon nigricans*), Restless Flycatcher (*Sisura inquieta*), and White-backed Magpie (*Gymnorhina leuconota*). On our way back to Port Augusta we observed the Masked Wood-Swallow (*Artamus personatus*) with nest containing two eggs, and met with the *Calamanthus* again (Mr. G. Mathews has since informed me that it is a typical *C. campestris*). We once more found ourselves in Port Augusta, and left by the next morning's train for Adelaide. Thus ended our first trip to the North-West. It was rather disappointing, but if next season is more favourable we hope to pay the Gawler Ranges another visit.

Notes on the Mistletoe-Bird (*Dicaeum hirundinaceum*).

BY L. G. CHANDLER, R.A.O.U., MALVERN.

(Read before the Bird Observers' Club, 17th April, 1912.)

ALTHOUGH I have spent very little time in studying the habits of the Mistletoe-Bird, a few notes—hastily gathered as occasion offered—may perhaps be of interest. There seems little room for doubt that *Dicaeum hirundinaceum* is the principal seed-distributing agent for the mistletoe (*Loranthus*). I have examined the stomachs of different Honey-eaters, shot while feeding in a clump of mistletoe, and the examination proved that the birds had merely been feasting upon insects and the honey from the flowers. The *Dicaeum* appears to live almost exclusively on the mistletoe berries. This diet may occasionally be varied by the addition of small insects and nectar.

When searching on the ground beneath a clump of mistletoe, I have found the seed-case of the parasite, thus proving that the bird often, if not always, rejects this portion. One day I observed a bird drop one of these cases, but was too late to notice in what manner the seed was withdrawn. A glance at the rejected portion showed that it had been split near the large end only, and the seed squeezed through. To convince myself that the seed of the *Loranthus* was not in any way damaged by passing through the bird's body, I placed three seeds, taken from the stomach of a Mistletoe-Bird on a climbing vine in my garden at Malvern. Within a week the seeds were firmly stuck on the vine, and from each one a small green stalk had started to grow upward. About a month after the seeds were placed

on the vine, the stalks had grown a little longer, but the roots were very small. The parasite, even at this immature stage, appeared to be perfectly healthy. The Mistletoe-Bird is more abundant than many persons realize.

Owing to its small size and restless habits, it can be easily overlooked, if one is not familiar with the call-note. One may hear the sharp notes of a *Dicaeum* while some distance away, and, next moment the bird will be rapidly working through a clump of mistletoe above one's head. A few minutes' respite and it is away again, perhaps on



Nest of Mistletoe-Bird.

FROM A PHOTO. BY L. G. CHANDLER

a flight of several hundred yards, although there may be a number of mistletoe plants close at hand. This species has a variety of short calls and a series of exceedingly sweet notes; it is among the best of our small song-birds. On several occasions I have listened with pleasure to the beautiful song. Whilst singing, the bird—contrary to its usual custom—will remain in a tree for some time. It invariably perches on an exposed limb when singing. One call, used apparently only in the breeding season, resembles a familiar call of the *Sericornis frontalis*. When one hears a male bird emitting these notes it is a sign that a nest is not far away.

My first experience of the nidification of the Mistletoe-Bird was on 3rd November, 1908, in the Dandenong Ranges, when in company with Mr. T. H. Tregellas. At the head of a thickly-timbered gully we watched a female building its beautiful purse-like nest. The nest—placed about 25 feet from the ground, in a stringy-bark gum sapling—was fastened to a single twig at the extremity of a bough. We first noticed the bird obtaining spider-web from a species of *Acacia* about 30 yards from the nest. When flying to and from the nest it uttered the usual sharp, monosyllabic note,



Young Mistletoe-Birds.

FROM A PHOTO, BY L. G. CHANDLER.

and we were thus able to trace it to the sapling in which it was building. The female alone was engaged in the work of construction, and had apparently just begun operations. The male was not noticed in the vicinity at any time. The female worked rapidly, staying at the nest for from five to nine seconds, and returning within a two-minute limit. When constructed, I again visited the locality to secure the nest and eggs. Unfortunately, while sawing off the limb the weight of leaves on one side caused it to twist in my hands, and the eggs fell to the ground. The nest was built of a fluffy substance, which grows on a tree locally called the "flannel-tree" or "blanket-wood,"

while the excreta of wood-boring insects was here and there firmly bound on with cobweb.

At Frankston (Vic.) on 5th November, 1911, I secured some interesting notes on the nidification of this species. Hearing a male bird utter its nesting call, I was quickly on the spot. A small bird flashed past me, apparently coming from the ground, and by its notes and flight I easily recognized it as a Mistletoe-Bird. I examined the place whence it had appeared to fly, and found a tangle of wool in a fallen branch. Concluding that the bird was gathering the wool for a nest, I waited. Soon the female was back at the wool, while the male perched in a tree about 20 yards off, uttering loud notes. The moment his mate left he joined her, and their sharp notes quickly died away. The timber was too dense for me to follow their flight by sight, but I realized that the nest must be some distance from where I stood. There was nothing for it but to trace the birds by their notes. With this object in view, I walked about 50 yards in the direction in which they had flown, and as the birds passed and re-passed—often unseen—I followed them until eventually I found the nest, which was being built in a small gum sapling about 6 feet from the ground, in an open position. From the fallen limb where the wool was gathered to the nesting-site the distance was fully 200 yards. The female was building with feverish energy. While she was at the nest the male, perched on a dead tree a few yards away, uttered the *Sericornis*-like notes. As soon as she left he was after her, a flash of crimson and blue. The male at no time assisted in collecting material or building the nest. On the 19th of the same month I visited the locality with a camera, and, after a long wait, succeeded in photographing the female bird at the nest. Unfortunately the plate was damaged in the course of the day. The nest contained three eggs, about half incubated.

Mistletoe-Birds are fairly numerous at Melton (Vic.), and one day in November, 1911, Mr. F. E. Wilson found two nests there, built in mallee saplings. All through the Dandenong Ranges Mistletoe-Birds are plentiful, and at Beaconsfield, the southern extremity of the Dandenongs, Mr. Wilson located several nests last season. One example was built in a spray of flowering "blanket-wood" tree—the most beautiful nest I have seen of the species. I obtained a photograph of two of the chicks from a nest. Both sexes were observed feeding their offspring on mistletoe berries, and at no time while we watched did they bring other food. I noted that the outer case of the seed had been removed. A note-book containing a description of the young birds has been mislaid. From memory I can only say that in colouration the fledglings resembled the adult female bird. Like the *Pardalotes*, the *Dicaeum* remains in southern Victoria throughout the year.

Stray Feathers.

Lyre-Birds.—In a letter to me lately, Mr. L. C. Cook spoke of the tameness of a Lyre-Bird (*Menura victoriae*). He visited, in company with a lady, a Lyre-Bird's nest that had just been finished. "On approaching it the female bird flew off and at us again and again, and finally raked the earth about and picked up stray morsels and ate them within 4 feet of us, alternately flying and running into the tree-tops around, but never leaving us during the time we were there—about half an hour. I then placed the lady in a favourable position, and, making a detour, frightened two females and one beautiful male bird to within 3 feet of her. The birds ran along the log on which she was concealed, and she had a beautiful view of them."—D. LE SOUËF. Melbourne, 14th August, 1912.

* * *

Notes of Restless Flycatcher.—In my article on Eyre Peninsula ornithology I spoke of the Restless Flycatcher (*Sisura inquieta*) as uttering the strange grinding notes only when hovering above the ground. In many years of observation I have found this to be the rule; but "there is an exception to every rule." Mr. A. H. Chisholm, of Maryborough, Victoria, in a letter to me, says:—"You may be interested to hear that I have found this habit, while general, not constant with the Restless Flycatcher. A year ago I saw one of these birds in the act of uttering the grinding note while resting on a stump, and I was surprised. Strangely enough, a day or so after reading your article in *The Emu*, I verified the previous observation by seeing and hearing a Flycatcher uttering the grinding notes in good style *while sitting on the ground*." This is very interesting to me, for I have never before heard of the Restless Flycatcher behaving like this.—(CAPTAIN) S. A. WHITE. Fulham, S.A., 8th August, 1912.

From Magazines, &c.

Gould League of New South Wales.—The Gould League of Bird Lovers of New South Wales is making steady progress. In connection with Bird Day, 9th October, 1912, a "bird-life" supplement to the *Public Instruction Gazette* has been issued. Printed on art paper, enclosed in a neat cover, the supplement is well illustrated, and contains some interesting articles and notes. Mr. W. W. Froggatt writes upon "Insectivorous Birds"; Miss Amy E. Mack contributes a fable, "Why the Bronze-Cuckoo Wails?" which is characterized by her usual delicate fancy; and Mr. A. G. Hamilton deals with the subject of "Protective Colouration," and gives a useful list of publications relating to Australian birds. "Bird-Life Near Home," by Thos. P. Austin, is an article (abridged) from *The Emu*. Bird paragraphs, Gould League notes,

and poems are among the other contents. Some of the illustrations are from photographs by Mr. A. H. E. Mattingley, C.M.Z.S. A copy of the Gould League (N.S.W.) certificate forms an inset.

* * *

Mutton-Birds.—Adverting to the excursion of the B.O.C. to Phillip Island rookeries (*vide* page 58), the following observations made on the Aleutian Islands (a far cry from Phillip Island to the Aleutians) by Mr. A. C. Bent, June, 1911, and published in the *Smithsonian Miscellaneous Collection*, vol. lvi., No. 32, will be read with interest:—"Among the vast flocks of dark-coloured Shearwaters (*Puffinus griseus* and *P. tenuirostris*)* seen in and about Unimak Pass, it was impossible to separate these two species at any great distance. Certainly both species were present, for we identified both at close range, though none were shot, as we could not pick them up. I never saw anything approaching their abundance in Unimak Pass when we went through there on 4th June; small black whales were numerous, and the Shearwaters were following them about to feed upon the remnants of food left on the surface by the whales; on account of this habit they were called 'Whale-Birds.' The water was literally black with birds all around us as we sailed through acres and acres of them, wildly scrambling to get out of our way or rising in great clouds to sweep away over the smooth water. For several hours we were almost constantly seeing or passing through these great rafts of Shearwaters, and I should not dare to hazard a guess as to how many hundred thousand we saw."

* * *

"Reference-List to the Birds of Australia."—Mr. Gregory M. Mathews, in *The Emu*, vol. vii. (1908), published a "Hand-list" of Australian birds showing 883 species. He now publishes, in the *Novitates Zoologicae*, vol. xviii. (1912), a "Reference-List" bringing the species and sub-species up to 1,448. Mr. Mathews has found it necessary to add and alter numerous names, and to create many new genera, the whole being an example of a great amount of research and laborious toil.

In reviewing the "Reference-List," *The Ibis* (1912), p. 346, remarks:—"We quite agree with Mr. Mathews in pronouncing this proceeding to be 'revolutionary.' Nothing like it, we believe, has been done before, and it is evident that Mr. Mathews takes quite a different view from his fellow-workers of what is sufficient variation to necessitate the recognition of a sub-species. So far as we can make out, the sub-species first described in the present list are about 540. Each of them is accompanied by a short statement as to how it differs from its nearest ally, but the characters assigned to them are in most cases extremely meagre. Such slight variations as being 'paler above,' or 'darker below,' or 'size less,' especially when there is a difference in locality, seem to

* Both birds are Australian, the latter being the Phillip Island species.—EDS.

Mr. Mathews to be quite sufficient for the foundation of a new sub-species, and he proceeds accordingly. It is quite impossible for us to go into controversy with one who 'has personally handled' 30,000 specimens of Australian birds, but we are quite certain that there must be a mistake somewhere, and leave it to others who are better acquainted with the Australian Ornis than we are to find out where these mistakes are."

"Additions and Corrections" to Mr. Mathews' "Reference-List" appear in *The Austral Avian Record*, vol. i., No. 3, pp. 73-80.

Correspondence.

MR. MATHEWS' LIST OF AUSTRALIAN BIRDS: A QUERY.

To the Editors of "The Emu."

SIRS,—Is there any necessity for ornithological students to have so many sub-species to wade through as Mr. Mathews has created in his latest list of Australian birds? Are we to assume that through force (or possibly change) of environment some comparatively small differences are created that form a sufficient basis for a new sub-species? Were there not too many before this list was issued?

Granted that the new "sub-species" should be so described, why give personal names instead of descriptive ones? To give a name which describes the sub-specific character, if necessary, would be an advantage from an educational standpoint. Is this new list such aid as it should be for purposes of identification?

The use of personal names in science is always understood to be complimentary to persons who have made some noteworthy discovery, or who have performed a signal service to the particular branch in which they are interested—not merely for collectors who may by chance (or for gain) forward some local variety or phase of bird or other life procured in their own neighbourhood in the hope of their names being handed down to posterity. Does not giving the name of the collector to every new sub-species (?) sent in discount its worth and the value of distinctions which have been worthily bestowed?—I am, &c.,

H. KENDALL.

To the Editors of "The Emu."

SIRS,—My attention has been drawn to the preface in Mr. Gregory Mathews's work, "The Birds of Australia," wherein the learned author makes the following statement regarding the nomenclature of Australian birds:—"The most gratifying feature in connection with my work is the declared intention of the Royal Ornithologists' Union (voiced by Mr. Milligan, *Emu*, vol. xi., p. 136, 1911) to give loyal adherence to the system, presently adopted by the national authority on ornithology within the British Dominions, namely, the British Museum.

"This action at once decides the acceptance of that adopted by me throughout this volume," &c.

To remove all misapprehension on the subject, let me say at once that, in the declaration of my intention, I voiced neither the intentions nor the opinions of the Royal Ornithologists' Union or of the Check-list Committee, but simply my own. At the time I was well aware that there were very many members of both bodies who were not in agreement with me, and who intended not to be guided by the British Museum, or any other authority, but to mark out an independent course.—I am, &c.,

ALEX. WM. MILLIGAN.

103 William-street, Melbourne, 16/9/12.

Bird Observers' Club.

THE annual meeting of the Bird Observers' Club was held on Wednesday evening, 15th May, 1912, at the Mia-Mia Tea Rooms, Collins-street. There was a good attendance of members. Mr. Mattingley read extracts from a letter written by Mr. Jas. Buckland *re* sales of Emu and Bird-of-Paradise skins in London. Mr. Buckland stated that Germany was going ahead in the matter of bird-protection, but France was slow in falling into line. The hon. secretary then read a report of a recent trip to Phillip Island, undertaken by members of the B.O.C. It was decided that the hon. sec. write to the R.A.O.U., with a request that a brief report of the experiments conducted among the Mutton-Birds be published in *The Emu*, and that other magazines be asked to copy. Mr. F. E. Wilson, the hon. treasurer, presented the balance-sheet for the past 12 months. He was congratulated on the neat and concise manner in which he had kept the accounts. The balance-sheet was adopted. The hon. sec., in his report, commented on the good scientific work done by members. Birds and eggs new to science had been procured and described, and valuable ornithological books written. Office-bearers for the ensuing year were elected as follows:—President, Dr. H. W. Bryant; hon. treasurer, Mr. F. E. Wilson; hon. secretary, Mr. L. G. Chandler. The president, hon. secretary, and hon. treasurer, and Messrs. E. B. Nicholls and Chas. Barrett, were appointed as a sub-committee to consider a scheme for the advancement of the Club, and report at the next meeting. Dr. Bryant mentioned that he had just returned from Woodside, Gippsland, where bird-life was abundant. He saw several mobs of Emus close to the homestead, and the birds were remarkably tame. Mr. T. H. Tregellas stated that he had seen White-plumed Honey-eaters (*Ptilotis penicillata*) feeding young on 10th May. Mr. Mattingley said he believed that a new species of *Malurus* existed at Alexandra, in the Goulburn Valley (Vic.) On behalf of Mr. H. L. White, of New South Wales, Mr. A. J. Campbell exhibited a new bird for Australia, collected at Cape York—namely, *Piezorhynchus decto*, of New Guinea. Skins of ♂ and ♀ were exhibited, also, for comparison, ♂ and ♀ *P. nitida*, from Napier Broome Bay, North-West Australia. Photographs taken at Phillip Island were exhibited by Messrs. H. W. Wilson and L. G. Chandler.

The monthly meeting of the Club was held at the residence of Mr. A. H. E. Mattingley, "Koonawarra," Glenferrie-road, Kew, on the evening of Wednesday, 26th June, 1912. Dr. George Horne was elected to represent the Club on the Council of the Australasian Association for the Advancement of Science. Mr. C. Price Conigrave was welcomed to the meeting by the president, and later in the evening he gave members a very interesting account of his exploration work in the North-West of Australia. He exhibited a large number of excellent photographs to illustrate his remarks.

On the motion of Mr. J. A. Ross, seconded by Mr. C. W. Wilson, it was decided to contribute one guinea towards the expense of the Flinders Memorial Tablet. Mr. C. F. Cole stated that the Bronze-Cuckoo (*Chalcococcyx basalis*) was seen at Auburn (Vic.) during April and June. Mr. T. H. Tregellas also had evidence of the presence of the Bronze (*C. basalis*), Fantail (*Cacomantis flabelliformis*), and Pallid Cuckoos (*Cuculus pallidus*) at Launching Place (Vic.), the birds still being there. On the motion of Mr. L. G. Chandler, seconded by Mr. A. J. Campbell, Mr. C. P. Conigrave was nominated as a member of the Club. On behalf of Mr. H. L. White, of New South Wales, Mr. A. J. Campbell exhibited two types of skins of *Ptilotis gracilis*, from Queensland, and skins of *Prion ariel* and *P. desolatus*, from New South Wales.

The monthly meeting of the Club was held at the Mia-Mia Tea Rooms, Collins-street, on 17th July. Messrs. C. Barrett and E. Brooke Nicholls acted as joint hosts. Mr. C. Price Conigrave was elected a member of the Club. A letter from Mr. A. H. E. Mattingley, dealing with the scheme for the advancement of the Club, was read. A discussion followed on the report of the sub-committee which had been appointed to deal with the question. It was finally decided that an amendment proposed by Mr. A. J. Campbell be incorporated in the report, and that the suggestions be sent to members. Mr. C. Barrett read a paper entitled "Method in Bird Observing." The subject was an interesting one, and the paper was discussed by several members. Mr. Barrett contended that it was more necessary to study the habits of birds than to describe eggs and nests. A life-history of the bird from a nestling was what we required. Mr. E. Brooke Nicholls read a list of migratory and partially migratory birds, which had been compiled by Mr. A. J. Campbell. Mr. Davis, of New Zealand, was welcomed to the meeting by the president, and he responded by a brief account of some New Zealand birds. Mr. T. H. Tregellas mentioned that he had recently received a letter from a friend living near Kerang. Big gun shooting was carried on around Kerang, on the swamp, and Ducks were being shot in the close season. It was resolved that the hon. secretary write to the Chief Inspector of Game, drawing his attention to the matter. Mr. J. A. Kershaw stated that five Lyre-Birds had been liberated at Wilson's Promontory. Interesting nature notes were contributed by Messrs. C. F. Cole, Stone, and other members.

South Australian Ornithological Association.

THE monthly meeting of this Association was held on Friday evening, 31st May, in the Royal Society's Rooms, North-terrace, Mr. E. Ashby presiding. Among other matters, a motion was passed in favour of recommending an amendment to the *Birds Protection Act* by adding the scientific terms to the birds' ordinary names. It was also recommended that Mathews' "Hand-list" should be taken as a standard, seeing that it is the most up-to-date one published. Mr. H. E. Laffer, of the Agricultural Department, was nominated as a new member. Part 2 of Mr. G. M. Mathews' *Austral Avian Record* was discussed, owing to its containing a long list of new sub-species. It was the opinion of many members that owing to the splitting into so many sub-species of the birds the study of Australasian Ornithology was confusing. The subject of the evening was the genus *Acanthiza*, and there was much discussion thereon. Mr. R. Zietz (Ornithologist to the Adelaide Museum) showed a fine series of these small birds for comparison. Mr. Ashby also showed some interesting forms of these birds. Capt. S. A. White brought several species of *Acanthizas*, among them *Acanthiza whitei*, from Kangaroo Island, lately described by Mr. G. M. Mathews as a new sub-species of *lineata*.

The monthly meeting of the Association was held at the Institute, North-terrace, on Friday evening, 29th June, Mr. E. Ashby presiding. A letter

was received from the secretary to the Commissioner of Crown Lands, stating that "the Spit" and adjacent islets at Kingscote, Kangaroo Island, had been proclaimed a bird reserve for over three years, and promising to have notices placed there to warn persons of the liability of trespassing to molest the birds. Several letters were read asking permission to take young Seagulls from these breeding places, but as the locality was now protected no permits could be recommended. Mr. H. E. Laffer was elected a member of the Association. Captain White tabled "Bulletin No. 3" of *The Emu*, describing several new birds and eggs, also two volumes of the *Ibis*. Mr. J. W. Mellor showed several species of Scrub-Wrens (*Sericornis*), notably two species from the lowest and highest elevations of the Adelaide district, and upon which experts both in Australia and Europe are differing in their opinion of nomenclature. The subject of the evening was a discussion upon the *Malurus* family, the best known representative about Adelaide being the Blue Wren (*Malurus cyaneochlamys*). A series was shown to illustrate the wide distribution of the bird in Australia, and the variations they assume in different localities. Mr. F. R. Zietz, the Museum ornithologist, displayed a fine series from the Adelaide public collection, containing the majority of the known species in Australia, and these were of great use in comparing specimens from private collections. Mr. J. W. Mellor tabled a rare species from the north and far north-west of this State, and described by Mr. A. J. Campbell, of Melbourne, as the White Wren (*Malurus whitei*), named in honour of the good work done by the late Mr. Samuel White. Mr. E. Ashley and Captain White exhibited Blue Wrens from Kangaroo Island, King Island, Tasmania, and the mainland, including the White-winged Wren (*Malurus leucopterus*), from the southern and northern parts of South Australia.

Notes and Notices.

Back Volumes of "The Emu."—Two complete sets (vols. i. to xi.), also some parts (now out of print), may be had on application to the editors.

Emu-Skins and Lyre-Bird Tails.—According to advice received from Mr. James Buckland, at the feather sales in London, 7th August, 765 Emu-skins brought from 6s. to 10s. 6d. each. Another inferior lot, of 222 skins, realized from 1s. 3d. to 2s. 3d. each, while 120 of the large curved feathers out of Lyre-Birds' tails brought 2s. 6d. each. How do these feathers get out of Australia?

California Academy of Sciences.—Dr. Leverett Mills Loomis, Director of the Museum, writes:—"In spite of the fact that the California Academy of Sciences collection contains over 2,000 Albatrosses and Petrels, and in spite of the fact that I have drawn largely on the museums and private collections of the United States, I find myself hampered by lack of material in reviewing the Tubinares. I will, therefore, be greatly obliged if you will send me the address of a reliable collector in Australia and one in New Zealand, from whom the Academy can purchase specimens of the Albatrosses and Petrels frequenting Australian and New Zealand Seas."

Acanthiza macularia (Gray).—To assist me in the preparation of a monograph on the *Acanthiza*, Mr. F. E. Wilson, the hon. secretary of the R.A.O.U., kindly placed at my disposal his private collection of *Acanthiza* skins.

On examining a large series of *A. pusilla*, and closely allied

forms, my attention was at once attracted to an unfamiliar form which conspicuously stood out from the others by reason of the lustrous live-brown tint of the upper surface, the uniform bright umber-brown tail, and the *erectile feathers of the forehead*.

After a little research, I proved it to be identical with *Saxicola macularia* of Quoy and Gaimard, obtained at "Port Western" in 1830. Mr. Wilson's specimen was obtained by him at Phillip Island, Western Port, Victoria—obviously the same locality.

In the British Museum Catalogue, vol. vii., p. 294, the late Dr. Bowdler Sharpe, after referring to *Acanthiza macularia*, predicted that it would prove to be *Acanthiza pusilla*.

I append a translation of the original specific description, as the former appears in the Catalogue, and except as to the omission of the conspicuously dark sepia flanks and the two minor points of difference hereafter indicated in parentheses, such description accurately fits Mr. Wilson's bird.

The frontal feathers alone render the bird easily recognizable, and also distinguishable from its nearest ally, *A. magnirostris* (Campbell), of King Island.

Description.—"Above rufous-brown, the frontal feathers loose and elevated in front, covering the base of the bill, and of a reddish colour with whitish spots; the bill is brown, straight, and a little curved at the point; the throat, breast, and belly are dull white streaked with brown (black); the tail, which is slightly rounded, is uniform rufous (burnt umber) and is marked near its tip with a broad transverse band; the feet are long, slender, and brown, like the toes. The female or young male differs in having the belly buff without striations."—ALEX. WM. MILLIGAN. William-street, Melbourne, 16/9/12.

Important Notice.

THE twelfth annual session of the R.A.O.U. will be held in Tasmania during November.

Inter-State members will leave Melbourne per s.s. *Loongana* on Friday, 15th, at 4 p.m.

Saturday, 16th, there will be an outing in the vicinity of Launceston, and in the evening a general meeting, when the presidential address will be delivered.

Monday, 18th, sessional business, and in the evening a lecture, free to the public.

Tuesday, 19th, in the afternoon, depart from Launceston for ten days' working camp-out on Flinders Group. (Some ornithological novelties are expected to be found among the Peaks of Flinders.)

After the camp-out some members will visit Hobart, and addresses to school children will be given.

Further details are announced on the hon. secretary's usual circular, which states expenses for the session need not exceed £7 per member—i.e., from Melbourne.

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HE objects of the Society are the advancement and popularization of the Science of Ornithology; the protection of useful and ornamental avifauna, and the publication of a magazine called *The Emu*.

The business of the Society shall be conducted by a Council, consisting of a President, two Vice-Presidents, Secretary, Treasurer, Librarian, Press Correspondent, Editors of *The Emu*, and fourteen members; each office-bearer and member of the Council shall retire at the end of each financial year, but shall be eligible for re-election.

The Annual Meeting shall be held in one or other of the principal towns of the different States, such State to be decided at the previous Annual Meeting.

Every member shall be required to pay an annual subscription of fifteen shillings, payable *in advance* in July each year. (Cheques, &c., subject to exchange, should include the amount of the exchange.)

The offices of the Society shall be at the office of the Hon. Secretary of the Society for the time being, or at such other place as the Council may appoint.

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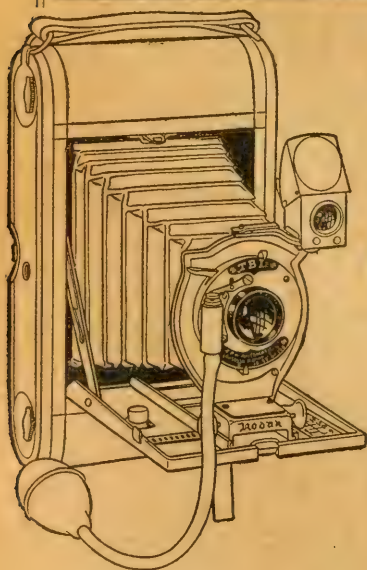
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Official Organ of the ROYAL AUSTRALASIAN ORNITHOLOGISTS' UNION.



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The Emu

Official Organ of the Royal Australasian Ornithologists' Union.

"Birds of a feather."

VOL. XII.]

1ST JANUARY, 1913.

[PART 3.

Royal Australasian Ornithologists' Union.

TWELFTH (LAUNCESTON) SESSION.

MINUTES OF THE TWELFTH ANNUAL SESSION OF THE ROYAL AUSTRALASIAN ORNITHOLOGISTS' UNION, HELD AT LAUNCESTON FROM 16TH NOVEMBER TO 19TH NOVEMBER, 1912.

FIRST DAY.

UPON arrival of the s.s. *Loongana* at Launceston on 16th November, the delegates from other States were met by Messrs. F. M. Littler, M'Comas, N. McGowan, and H. C. Thompson, local members of the R.A.O.U. In the afternoon the delegates were the guests of the Mayor of Launceston, and visited the famous Cataract Gorge and other beauty spots. At the close of the afternoon Mr. and Mrs. F. M. Littler entertained the party at afternoon tea.

The first general meeting of the session was held in the evening at the Art Gallery. Mr. J. W. Mellor presided. Those present were :—Col. W. V. Legge, Capt. S. A. White, Dr. G. Horne, Messrs. A. H. E. Mattingley, F. M. Littler, E. B. Nicholls, A. Scott, O. Rosenhain, C. F. Cole, H. V. Mattingley, H. C. Thompson, H. Griffiths, J. W. Hosking, E. Bewes, and F. Angel ; Mesdames A. Mattingley, J. W. Israel, C. F. Cole, and S. A. White, and Misses Toms, J. A. Fletcher, and Ireland. Apologies were received from Mr. R. Hall and others. Col. Legge welcomed the delegates.

After the minutes of the last annual session had been read and confirmed, Mr. F. M. Littler moved the adoption of the annual report. Dr. G. Horne seconded the motion, which was carried unanimously.

Mr. O. Rosenhain asked whether the motions passed at the last Congress had been acted upon. Mr. J. W. Mellor, president, in reply, stated that the Tasmanian Government had been written to, and had offered to take charge of any Lyre-Birds forwarded to Tasmania. Kangaroo Island had also been suggested as a new home for the Lyre-Bird, but he (Mr. Mellor) thought that Tasmania should come first. The Wild Birds Protection Society had taken the matter in hand in New South Wales.

Mr. Littler stated that the railway authorities in Tasmania had

made arrangements whereby specimens of protected birds were prohibited from being carried upon the railways of the State.

Col. Legge stated that the Western Highland district and Lake St. Clair would be the best locality to liberate any birds received.

In the absence of Mr. F. E. Wilson, hon. secretary, the annual report was read by Mr. A. H. E. Mattingley, the acting hon. secretary. On the motion of Col. Legge, seconded by Mr. H. C. Thompson, the report was adopted. Mr. C. F. Cole, in the absence of Mr. Z. Gray, read the hon. treasurer's report, which was adopted, on the motion of Mr. Mattingley, seconded by Mr. O. Rosenhain.

A letter was received from Mr. A. J. Campbell, regarding his visit to the locality of the working camp-out for the present session 19 years ago. The letter also referred to work on the "Check-list."

A letter from Mr. Atchison, secretary of the Wild Bird-Life Preservation Society, in reference to traffic in birds' plumes and feathers, was also read. Mr. Mattingley stated that in Melbourne surprise visits had been made to various shops, and plumes and feathers had been seized. Plumes had come in attached to hats, &c., and so the law had been evaded. It required great vigilance to detect the incoming of such plumes and feathers.

Contributions to the Coloured Figure Fund for the year were acknowledged:—W. J. T. Armstrong (Vic.), 4s. 6d.; Edwin Ashby (S.A.), £2 2s.; Isaac Batey (Vic.), 4s. 6d.; T. Bell (Vic.), 2s. 6d.; F. L. Berney (Qld.), 5s.; Miss M. Brumby (Tas.), 5s.; H. Burrell (N.S.W.), £1 1s.; Mrs. Burrell (N.S.W.), £1 1s.; Dr. E. H. Dobbyn (N.S.W.), 6s.; Dr. E. W. Ferguson (N.S.W.), 2s. 6d.; Miss J. A. Fletcher (Tas.), 7s. 6d.; H. W. Ford (Vic.), 5s.; G. Graham (Vic.), 2s. 6d.; Wm. Lawford (Vic.), 5s.; Col. W. V. Legge (Tas.), 5s.; Dr. W. J. Long (Vic.), 3s.; R. E. P. Osborne (S.A.), 10s.; A. W. Swindells (Tas.), 5s.; T. Tindale (Vic.), 2s. 6d.; Capt. S. A. White (S.A.), 10s.; Mrs. White (S.A.), 5s. Total, £8 14s. 6d. It was also announced that Mr. H. L. White, Belltrees, had paid the cost (£5 5s. 4d.) of the illustrations in part 3, vol. x., and part 4, vol. xi., of *The Emu*.

The president stated that the fund deserved support to enable the Council to publish in *The Emu* figures of new birds.

Mr. Littler wished to know whether the Council intended to figure all new birds discovered by members of the R.A.O.U. Mr. Mellor, in reply, stated that the Council would use discretion, and figure only good and authentic species. He did not think that sub-species would be described. Col. Legge favoured the suggestion that no specimens should be figured unless proved to be thoroughly sound species. Captain White agreed with Col. Legge when he stated that, if possible, the number of species to be described each year should be enumerated beforehand. Mr. Mattingley thought that the question of re-figuring badly figured species might be considered. Mr. Mellor stated that Mr. Littler's

remarks deserved consideration, and that the matter would be brought under the notice of the Council.

Mr. H. L. White, Belltrees, Scone, N.S.W., wrote suggesting that all Bulletins published by the R.A.O.U. should be issued to all members instead of to only a few members. Captain White suggested that Bulletins should be sent to each member, if funds would permit. Mr. E. B. Nicholls moved that copies of the Bulletins issued be sent to State secretaries. Captain White seconded the motion, which was carried.

Mr. A. H. E. Mattingley read a short paper on the subject of "Bird Protection," and moved the following motion, drawn up at the request of the National Council of Women of Australia:—"That the delegates of the Women's National Council, at a meeting of the Women of the World, which meets at Rome early in 1913, be empowered to move that it is desirable that each country should prohibit the import and export of any kind of bird protected in any other country."

Col. Legge gave his hearty support to the proposal. The interest of the women of Australia, he said, was most essential in this respect.

Mr. Mattingley drew attention to the importance of "ringing" birds as a factor in the elucidation of the problems of avian distribution. He referred to the work of the Melbourne Bird Observers' Club. Mr. Nicholls also discussed the matter.

A letter from Mr. J. Buckland, England, with regard to the permit issued by the Tasmanian Government for the killing of Penguins on Macquarie Island, was read. The islands are now leased by the Tasmanian Government, with the right to the lessee to kill Penguins and sea-elephants.

Col. Legge suggested that the Union should ask the Tasmanian Government to give a periodic supervision to the condition of the island, and moved that the Government be asked to make an inquiry into the whole matter; a periodic supervision and a report to be requested from the Mawson expedition. Captain White seconded the motion. Mr. Rosenhain stated that the price of Penguin oil had increased threefold in the past fifteen years, and he feared that in a little time the birds would be exterminated. He moved, as an amendment, that the agreement should be cancelled. Mr. Cole seconded the amendment, which was put and lost, and the original motion carried.

SECOND DAY.

The session was continued on 17th November. It was resolved that the names of Dr. R. W. Schufeldt and Mr. Ogilvie Grant be submitted to the Commonwealth Government for nomination as ornithologists representing the British A.A.S. at the annual session to be held in Australia in 1914.

The following were unanimously elected members of the Union:—

Victoria.—Mrs. Amy Beal, Varna, Lorne; Mr. Harry G. Cook,

Fitzroy; Mr. R. T. Littlejohns, Northcote; Messrs. Melville and Mullen, Melbourne; Mr. A. G. Murray, Abbotsford; Mr. J. C. M'Quade, St. Kilda; Mr. B. Schultz, Arkona, *viâ* Dimboola; Mr. F. Taylor, Hurstbridge; Mr. Reg. Walton, Auburn; Mrs. Horne and Miss Helen Bowie, Clifton Hill.

New South Wales.—Mr. W. Finigan, hon. secretary Gould League of Bird Lovers, Sydney; Mr. S. A. Hanscombe, Belltrees, Scone; Mrs. J. Oberlin Harris, Springhay, Merrylands; Librarian Australian Museum, Sydney; Mr. H. Rickards, Rockdale.

Queensland.—Mr. W. W. Chapman, jun., Homebush Mill, Mackay; Mr. J. Swanson, jun., Mackay.

South Australia.—Agricultural College, Roseworthy; Mr. F. Angel; Mr. E. Bewes; Miss M. S. Hornabrook, Avenal Gardens, Medindie; Mr. F. E. Parsons, Adelaide; Miss R. Toms.

Tasmania.—Mr. R. S. A. Green, Kelso, West Tamar; Miss E. M'Donald, Oatlands.

England.—Mr. Jas. Buckland, London, W.C.

United States.—Peabody Museum, Yale University, New Haven, Conn.

Sweden.—The Librarian, Royal Swedish Academy of Sciences, Stockholm.

Northern Territory.—Mr. J. Lewis, Chief Veterinary Officer, Port Darwin.

The following were elected office-bearers:—President, Mr. Robert Hall; vice-presidents, Messrs. A. H. E. Mattingley and Capt. S. A. White; hon. secretary, Mr. F. E. Wilson; hon. treasurer, Mr. Z. Gray; hon. librarian, Mr. W. H. D. Le Souëf; hon. press correspondent, Mr. E. B. Nicholls; hon. editors of *The Emu*, Messrs. A. J. Campbell and Charles Barrett.

Members of Council: Victoria, Col. C. Ryan, Dr. J. A. Leach, Dr. Geo. Horne; New South Wales, Dr. W. Macgillivray, Mr. A. F. Basset Hull; Queensland, Mr. C. A. Barnard; South Australia, Dr. A. M. Morgan; Western Australia, Mr. A. W. Milligan. Local State secretaries:—Victoria, Mr. F. E. Wilson; New South Wales, Mr. A. S. Le Souëf; Queensland, Dr. Hamlyn Harris; South Australia, Mr. J. W. Mellor; Western Australia, Mr. T. Carter; Tasmania, Mr. F. M. Littler; Northern Territory, Mr. G. F. Hill.

Mr. J. W. Mellor, the retiring president, then vacated the chair, and Captain S. A. White officiated in the absence of Mr. Robert Hall, C.M.Z.S., the president-elect.

Mrs. J. W. Israel moved—"That, as the islands of Bass Strait practically belong to Tasmania, it is desirable that the Government and people of Tasmania should erect a memorial to that intrepid navigator, George Bass, and that the suggestion be forwarded to the proper authorities." Mr. Mattingley seconded the motion, which was carried.

Miss J. A. Fletcher, of Springfield, Tasmania, read a most instructive paper, which was illustrated by photographs, entitled "Field Notes on the Emu-Wren."

Mr. O. W. Rosenhain read a paper dealing with the destruction of bird-life, and embodying his observations during a trip to Europe and other countries. He gave statistics showing the alarming manner in which birds were decreasing in numbers in all parts of the world, owing chiefly to the persecution of plume-hunters and collectors. He made suggestions for reforms, and urged that restrictions should be placed on collectors as well as the plume-hunters.

Mr. A. H. E. Mattingley complimented the author on his paper. It was a valuable contribution to the literature of bird protection. The question was a vexed one, and, as there was still a lot of work to be done in Australia, and the collection of a certain number of specimens was necessary, indiscriminate slaughter was to be deprecated. Mr. J. W. Mellor said that the amount of destruction was deplorable. Albatrosses, Herons, and Egrets had been nearly exterminated throughout the world. Dr. G. Horne considered that the solution of the problem lay in the education of the public generally in the matter of bird interest and bird protection. Col. Legge stated that large collectors in Europe, the proprietors of private museums, were responsible for the destruction of birds. The case of the Chatham Island Rail was a case in point. Collectors visited this island and exterminated this rare species, along with others.

A thesis entitled "*The Morphology of the Strepera*," by Dr. J. A. Leach, was read. Diagrams in illustration were shown.

Mr. J. W. Mellor proposed that the next session of the Union be held in Western Australia. Mr. Rosenhain seconded the motion, which was carried.

THIRD DAY.

The session was continued on 19th November, Mr. A. H. E. Mattingley presiding. The chairman stated that during the last two years the special committee had been labouring to bring the Check-list matter before the members of the Union. The material contained in the committee's report was of paramount importance to ornithologists of Australia and other parts of the world, and the report would mark an epoch in the history of the Union.

Mr. A. W. Milligan then read the report of the Check-list Committee.

Captain White, in discussing the report, stated that it was an important matter, and required much thinking over. Dr. G. Horne stated that the numerical system had now come into use in the astronomical world. He wished to know whether the system was an experiment of the committee or otherwise. Mr. Milligan said that it was a system modelled on Dewey's Universal Library System. Col. Legge stated that, as an English ornithologist, working in company, in 1880, with Dr. Bowdler Sharpe, H. Seebohm, and other celebrated ornithologists, he found, even at that early date, that the trinominal system was considered cumbersome. He agreed with Dr. Sharpe that the trinominal system

would break down of its own weight. Captain White said that, in his opinion, notwithstanding mistakes, the trinominal system would outlast the binominal one.

After further discussion, the following was moved by Mr. O. W. Rosenhain and seconded by Mr. H. C. Thompson:—

“That the Royal Australasian Ornithologists' Union hereby accepts and adopts without reservation the report of the Check-list Committee (with the classification annexed) now presented, and affirms the principles contained in the report and classification.”

Captain White moved as an amendment that consideration of the matter be deferred. Dr. Horne seconded the amendment, which was put to the meeting and lost.

Mr. F. M. Littler then moved—

“That this Union hereby adopts the recommendation of the Check-list Committee for the appointment of a Perpetual Check-list Committee (to consist of seven members) for the purposes and with the powers mentioned in such report.”

Mr. C. F. Cole seconded the motion, which was carried.

The following motions were also agreed to:—

“That the members of the Perpetual Check-list Committee be elected annually at every session, except that, until death or resignation or refusal or neglect to act, each of the following ornithologists—Colonel W. V. Legge and Messrs. J. W. Mellor, A. J. Campbell, A. F. Basset Hull, Robt. Hall, and A. W. Milligan—shall be permanent members of the committee.”

“That Captain S. A. White and Mr. F. M. Littler shall be the first annual members of the Perpetual Check-list Committee.”

“That this Union hereby adopts the recommendation of the Check-list Committee for the appointment of a committee to draw up a Code of Nomenclature for future guidance of Australian ornithologists, based upon that of the International Ornithologists' Congress, but with such modifications as may be rendered necessary by the adoption of the principles contained in such report.”

“That the Commonwealth Government be asked to publish the transactions of this Congress, or grant a sum of money to cover cost of publishing the transactions.”

VOTES OF THANKS.

Votes of thanks were passed to the Mayor of Launceston, Mr. and Mrs. F. M. Littler, the Trustees of the Victoria Museum and Art Gallery (for the permission given to use the rooms); Mr. W. C. Oxley, Melbourne, for loan of fishing net; and to Messrs. Swallow and Ariell, Mr. John Plisch, Mr. and Mrs. Clark, Mrs. Whyte, and the Misses Wallace for gifts of biscuits and confectionery for the half-caste children on Cape Barren Island.

EXCURSIONS AND LECTURES.

The delegates from other States were most hospitably entertained by Tasmanian members of the Union, who had arranged excursions to places of special interest in and around Launceston. As already stated, on arrival at Launceston the delegates were met by Mr. F. M. Littler and other members. In the afternoon they were the guests of the mayor of the city, and were driven to the electric power station in the Cataract Gorge. Mr. and Mrs. Littler provided afternoon tea, which was enjoyed in a picturesque spot.

On Sunday, 7th November, the visitors were the guests of Mr. and Mrs. Littler. The party was conveyed in drags to Distillery Creek, several miles from Launceston. Birds were plentiful, and several nests containing either eggs or young birds were discovered. The flowering shrubs also gave the ornithologists much pleasure.

A public lecture was given by Mr. A. H. E. Mattingley on Monday evening, 18th November, in the Art Gallery. The title of the lecture was "Amid Australian Palm Islands and on Coral Strands," and the wonderful animal life of the tropical north was described. The lecturer suggested that an endeavour should be made to form in Tasmania a society having for its object the study of the native birds. The lecture was illustrated by a fine series of lantern slides.

On the morning of Tuesday, 19th November, Captain S. A. White and Dr. G. Horne addressed a large gathering of State school pupils on the subject of "Birds and their Protection." Captain White stated that in Tasmania and on the islands around the shores of the State there existed a remarkable flora and fauna, which, if not afforded protection, would soon pass away, like the extinct Tasmanian Emu. He asked the children to study birds, and described the habits of some of the insectivorous species. Mr. T. Kildea, on behalf of the Education Department, thanked the speakers. He remarked that addresses of the kind given by Captain White and Dr. Horne were a decided help to the scholars, conveying to them more knowledge of the creatures of their native land.

ANNUAL REPORT.

LADIES AND GENTLEMEN,—It gives the Council much pleasure to present to you the Twelfth Annual Report of the Royal Australasian Ornithologists' Union. Since the last annual meeting thirty new members have been elected and the names of thirty-four have been removed from the rolls for various reasons. The Council greatly regrets the death of Dr. W. T. Angove, of South Australia, who joined the Union in 1905. During the year Mr. W. H. D. Le Souëf was elected a corresponding member of the American Ornithologists' Union. Nine Council meetings were held in the course of the financial year. The Council again desires to thank Col. Charles Ryan for his kindness in placing his rooms in Collins-street, Melbourne, at its disposal for the

RECEIPTS AND

For Year ended

| RECEIPTS. | | | £ | s. | d. | £ | s. | d. |
|--|--|--|----|----|----|-----|----|-------|
| To Balance—Coloured Figure Fund, Cr. ... | | | 30 | 11 | 2 | | | |
| „ „ General Fund, Dr. ... | | | 20 | 19 | 3 | | | |
| | | | | | | | 9 | 11 11 |
| „ Subscriptions ... | | | | | | 185 | 17 | 6 |
| „ „ Part 3, vol. x. ... | | | | | | 9 | 10 | 0 |
| „ „ in Advance ... | | | | | | 16 | 6 | 0 |
| „ Sales— <i>The Emu</i> ... | | | | | | 14 | 8 | 4 |
| „ Exchange ... | | | | | | 1 | 19 | 6 |
| „ Donations—H. L. White, Esq., Illustrations ... | | | | | | 5 | 5 | 4 |
| „ „ Coloured Figure Fund ... | | | 8 | 14 | 6 | | | |
| „ Advertisements—Coloured Figure Fund | | | 5 | 10 | 0 | | | |
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ASSETS AND

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| ASSETS. | | | £ | s. | d. | £ | s. | d. |
|--|--|--|----|----|----|-----|------|------|
| General Fund—Bank Cr. ... | | | 18 | 9 | 7 | | | |
| Coloured Figure Fund—Bank Cr. ... | | | 25 | 18 | 2 | | | |
| | | | | | | | 44 | 7 9 |
| Library ... | | | | | | 25 | 0 | 0 |
| <i>The Emu</i> in Stock, say 2,767 parts, at 1s. ... | | | | | | 138 | 7 | 0 |
| Illustration Blocks ... | | | | | | 20 | 0 | 0 |
| Subscriptions in Arrears, say ... | | | 24 | 0 | 0 | | | |
| Less Prepaid ... | | | 17 | 1 | 0 | | | |
| | | | | | | | 6 | 19 0 |
| | | | | | | | £234 | 13 9 |

Z. GRAY, L.C.A., *Hon. Treasurer.*

1st July, 1912.

EXPENDITURE

30th June, 1912.

| EXPENDITURE. | | | | £ | s. | d. | £ | s. | d. |
|---------------------|-------------------------------|-----|-----|-----|-----|------|------|----|----|
| By <i>The Emu</i> — | Printing, &c., vol. xi. | ... | ... | ... | ... | ... | 134 | 0 | 6 |
| | Illustration Blocks, vol. xi. | ... | ... | ... | ... | ... | 22 | 6 | 4 |
| | Coloured Plate, D | „ | ... | ... | ... | ... | 18 | 17 | 6 |
| | Binding for Patrons | ... | ... | ... | ... | ... | 0 | 15 | 0 |
| „ | Congress, 1911 | ... | ... | ... | ... | ... | 5 | 1 | 3 |
| „ | Sydney Lecture | ... | ... | ... | ... | ... | 3 | 9 | 10 |
| „ | Library Requisites | ... | ... | ... | 4 | 0 8 | | | |
| „ | Insurance | ... | ... | ... | 0 | 9 5 | | | |
| | | | | | | | 4 | 10 | 1 |
| „ | Postage | ... | ... | ... | 14 | 16 9 | | | |
| „ | Stationery | ... | ... | ... | 4 | 0 6 | | | |
| „ | Typing | ... | ... | ... | 0 | 15 2 | | | |
| „ | Carriage | ... | ... | ... | 0 | 10 0 | | | |
| „ | Covers | ... | ... | ... | 0 | 4 6 | | | |
| | | | | | | | 20 | 6 | 11 |
| „ | Exchange | ... | ... | ... | 2 | 3 8 | | | |
| „ | Bank Charge | ... | ... | ... | 0 | 10 0 | | | |
| „ | Cheques | ... | ... | ... | 0 | 2 6 | | | |
| „ | Commission | ... | ... | ... | 0 | 11 9 | | | |
| | | | | | | | 3 | 7 | 11 |
| | | | | | | | 212 | 15 | 4 |
| „ | Balance—General Fund, Cr. | ... | ... | 18 | 9 | 7 | | | |
| | Coloured Figure Fund, Cr. | ... | ... | 25 | 18 | 2 | | | |
| | | | | | | | 44 | 7 | 9 |
| | | | | | | | £257 | 3 | 1 |

LIABILITIES

June, 1912.

LIABILITIES.

*Nil.**Audited and found correct.*

| | |
|---------------|-------------------------|
| W. A. BLAIR, | } <i>Hon. Auditors.</i> |
| C. W. WILSON, | |

MELBOURNE, 16th October, 1912.

purpose of holding meetings. Through representations made by the Council, the Queensland Government has proclaimed Raine Island, Hinchinbrook Island, Goold Island, Garden Island, Eva Islet, Agnes Islet, Channel Rock, and the Barnard Group of Islands sanctuaries for native game. It is now hoped that the Nutmeg-Pigeons which breed on some of these islands will escape the persecution to which they have been subjected in the past. The South Australian Ornithological Association, supported by the Royal Australasian Ornithologists' Union, has been successful in inducing the South Australian Government to set aside a large portion of Kangaroo Island as a sanctuary for native fauna. The Association is to be congratulated upon having liberated some Mallee-Fowl (*Lipoa ocellata*) upon the island, where they will be immune from the attacks of foxes and other enemies. The Gould League of Bird Lovers continues to prosper in the different States. Many papers forwarded by children in connection with League essay competitions show that there is being formed in the Commonwealth an army of young observers. During the year, a deputation from the Council waited upon the Minister for Agriculture for Victoria to protest against the early opening of the Quail season in the State. The Minister seemed impressed with the arguments brought forward, but the season was again opened early. The Council then decided to circularize all members and persons interested, asking for information as to the condition of the birds upon the opening day.* Letters were forwarded to the Premiers of the different States requesting them to follow the example of South Australia and prohibit the carriage of protected birds upon the railways. Two States, Tasmania and Western Australia, complied with the request. The Union has again to thank the Zoological and Acclimatization Society of Victoria for having shelved its library during the past year. Mr. C. Price Conigrave, a member of the Union, has distinguished himself by leading an exploration party into the little-known parts of North-West Australia. Another member, Mr. Gerald Hill, while accompanying Captain Barclay's expedition, made valuable field notes regarding birds. The thanks of the Union are due to Mr. H. L. White, of Belltrees, Scone, New South Wales, for his generosity in defraying the cost of the plates which have accompanied articles written by his collectors and published in *The Emu*. The Council is of opinion that there is need for a large extension of the membership list, and it hopes that, during the coming year, each member will endeavour to persuade at least one of his or her friends to join the Union. The editors of *The Emu*, Messrs. A. J. Campbell and Charles Barrett, are to be congratulated upon the excellence of the publication, both from a literary and scientific standpoint. Many valuable and interesting papers have been contributed by members, and several new birds and hitherto unknown eggs have been described in the

* See statement, p. 203.



Mr. John White Mellor
(Sixth President Royal Australasian Ornithologists' Union).

FROM A PHOTO. BY CROWN STUDIOS, ADELAIDE.

journal. Finally, the Council desires to thank all friends who have in any manner assisted in furthering the aims of the Union or the study of ornithology generally in the past twelve months.

F. ERASMUS WILSON, *Hon. Secretary.*

President's Address.

By J. W. MELLOR, ADELAIDE.

BIRD PROTECTION IN SOUTH AUSTRALIA.

IN South Australia, as in other parts of the Commonwealth, the protection of birds is highly necessary, for, apart from their æsthetic value, they perform important functions, keeping in check the vast hordes of insects that attack vegetation. The birds are friends of man, allowing his fruit and produce to come to maturity. In South Australia the value of bird-life was recognized earlier than in some of the older and more advanced States. The need of affording protection to species whose usefulness was most evident was realized by practical bird observers in fairly early times, and in due course laws were enacted accordingly. This was only the first step towards the goal. Laws may be made, but there remains the difficult task of having them respected. In the more unsettled parts they were mostly honoured in the breach. It was seen that the public needed to be educated and then it would naturally extend a protecting hand over the useful birds.

South Australia was one of the first of the States to introduce nature study into the public schools, and thus lead the rising generation to observe and learn the habits of native birds. Knowledge inculcates a desire to protect. It is pleasing to find the other States encouraging nature study.

ACTS OF PARLIAMENT.

The first Act of Parliament passed in South Australia to protect "birds and other animals" dates back to 1863. The imported or acclimatized birds protected under its provisions for a portion of the year—from 1st August to 31st December—included Pheasants, Partridges, Grouse, Swans, Thrushes, Linnets, Finches, Starlings, Blackbirds, and Sparrows. It was unwise to afford protection to the last three species, but at that time it was difficult to divide the good from the bad, and mistakes were made. It was thought that the Sparrow introduced was the useful Hedge-Sparrow, but the species proved to be the pert and active House-Sparrow (*Passer domesticus*), whose destructiveness is too well known. The "native" birds protected from 1st September to 30th November were Landrails, Wild Ducks, Teal, Plover, Water-Hens, Widgeons, Bitterns, Herons, Quail, Black Swans, Nankeen Herons, and Grey Geese and Black-and-White Geese. Those protected from 1st August to 30th November were Wild Turkeys,

Native Pheasants, Emus, Laughing Jackasses, Magpies, Pigeons, and Curlews. The Act applied to within the limits of counties and hundreds, and did not apply to the "out-back" country. Half the amount of the fines imposed went to those giving information leading to the conviction of offenders, and half to the Crown. This Act held good for some time, but it was not respected, I am afraid, as it should have been.

In 1871 a movement was started to bring in a more comprehensive measure, which was called the Oyster Fishery and Game Bill. The late Sir William (then Mr.) Morgan and the late Sir Henry (then Mr.) Ayers helped the project. (Dr. A. M. Morgan, whose interest in native birds is well known, is a son of Sir William Morgan.) Mr. M. Symonds Clark, also well known in Adelaide as a bird-lover and protector, came in touch with the legislators, and suggested alterations to the bill to make it more workable. The most noteworthy suggestion was that all birds be brought under partial protection by inclusion instead of exclusion, those whose habits seemed objectionable to the producers being named. Thus a cumbersome bill, with 17 headings for protected birds alone, was reduced. The birds excluded from protection were Eagles of all species, Hawks of all species exceeding the size of the Nankeen Kestrel, Crows, Black Magpies, Wattle-Birds, Silver-eyes, Yellow-crested Cockatoos, Rosella Parrots, and Water-Hens. Lest some of the birds included in the protected list should become obnoxious to producers, Mr. Clark proposed that provision be made to allow "killing and taking" of the birds in any garden, vineyard, or field of corn. He spent much time urging members of Parliament to accept the measure, but much opposition was raised, and it was not until 1874 that the bill became law. Thus another step in the bird protection of South Australia was accomplished. In 1886 a third measure was passed to remedy small defects in the working of the 1874 Act. This Act in time also showed its imperfections, and in 1893 a bill was prepared by Mr. (now Sir) J. L. Stirling, and introduced into the Upper House. Its passage however, was blocked. Thenceforward the cause of the birds was championed by bird-protection societies which had come into existence—namely, the Native Fauna and Flora Protection Committee of the Field Naturalists' Section of the Royal Society, with Mr. Arthur F. Robin as first secretary, and, later, Mr. M. Symonds Clark; the British Society for the Protection of Birds (Adelaide branch), with Mrs. John Playford as secretary. Of both these societies I was an active member (on the committees), and made every effort, both officially and privately, to interest the people in the study of birds generally. Lime-light lectures were given, and the press was utilized to forward the movement. In 1897 Mr. Clark and I went into the matter carefully, and drew up a comprehensive bill. As the title, "Game Act," of the previous measure seemed to remind some people of the stringent "game laws" of England, we decided that the title of the new measure should

be "Birds and Other Animals Protection Act." Later, however, it was decided to deal only with the birds, and the words "and Other Animals" were deleted. In connection with this measure much credit is also due to Mrs. John Playford, who exerted herself to a great extent in interviewing persons of note—among others, the late Sir James Penn Boucaut, one of our most eminent judges, who thoroughly approved of the measure, and made sundry suggestions relative to the phraseology of the Bill.

The Hon. Thos. Playford (a brother-in-law of Mrs. Playford) undertook to introduce the bill into Parliament in 1899; but so much opposition was manifested, and so many alterations were desired, that the measure was not pushed forward too quickly. Much of the antagonism yielded to explanation. One clause, however, the opponents of the Bill could not tolerate, as they thought that underlying it was a hint of the old British game laws. This clause empowered private owners of land to make their properties "bird sanctuaries," in which no one, not even the owners themselves, could shoot the birds. The clause was struck out, and the measure, as the *Bird Protection Act*, passed both Houses just at the close of the 1900 session of Parliament. This Act brought about a much-needed reform in the total protection of a large number of our smaller and most useful species. The schedule—the first of its kind in Australasia—included nearly all unquestionably useful birds—Owls (all species), Podargus, Nightjars, Swifts (all species), Swallows and Martins (all species), Kingfishers (all species), Wood-Swallows (all species), Pardalotes (all species), Piping Crow-Shrikes (all species), Butcher-Birds (all species), Crow-Shrikes, Magpie-Larks, Blue Doves, Thickheads, Shrike-Tits and Bell-Birds, Thrushes (all species), Fantails, Flycatchers (all species), Robins (all species), Superb Warblers, Emu-Wrens, Acanthizas, Chats (all species), Larks (all species), Reed-Warblers and Bush-Larks, Bower-Birds, Tree-creepers, Cuckoos (all species), Stone-Plovers, Ibis and Spoonbills, Herons, Bitterns, Egrets, Gulls (all species), and Cape Barren Geese. An important clause was inserted in the measure, empowering the Governor-in-Council to approve of the adding to or taking away from any list, or changing from one list to another. Under this clause the following have been added to the list from time to time:—Emus, Kestrels, Swans, Plovers (all species), Grass-Parrots, Pigeons and Doves (all species), Gang-Gang Cockatoos, Black Cockatoos (all species), Mallee-Fowl, and Bustard. The Act also had a schedule for birds to be protected for a portion of the year, the close seasons dating from 1st June in some instances and 1st July and 1st August in others, but all ending on 20th December in each year. Another list gives the unprotected species—Crows, Wattle-Birds, Silver-eyes, Cormorants, Sulphur-crested Cockatoos, Hawks (except Kestrels), Snipe (Gallinago), (European) Starlings, (European) Chaffinches, (European) House-Sparrows, Rosella Parrots (*Platycercus adelaidensis* and *P. eximius*), (European) Blackbirds, and (European) Goldfinches. To define

the species, a departure was made in adding to the list the scientific names, also the numbers to each species according to Gould's "Handbook to the Birds of Australia," so that there could be no excuse for not knowing the identity of the species. The total protection of such a large number of birds made it necessary to insert a clause allowing permits to be granted for the collection of certain specimens for scientific purposes. This Act, which is in force at the present time, works well, although some slight amendments are still needed to make its application in certain directions more effective. An effort is being made accordingly.

The killing of large numbers of birds which are on the partially protected list during the Christmas holidays by short-sighted sportsmen (?) has troubled thoughtful ornithologists. The ending of the close season for Ducks on 20th December has been responsible for much slaughter of young and helpless birds and of the parents. Henceforth the season will extend until January in each year.

The bird-protection laws throughout the Commonwealth should be brought into line.

RESERVES.

The *Bird Protection Act* of 1900 gives power to the Minister for Crown Lands, under whose jurisdiction it comes, to proclaim areas of land still held by the Crown as "Bird Protection Reserves." Several areas where the birds can breed and rear their young in peace have thus been set aside. The total area of these reserves amounts to 41,275 acres, and, as they are in different parts of the State, they are of extreme value. The area, when compared with that of the reserves in other parts of the world, is, however, remarkably small. But if all the States gradually increase the number of reserves all will be well. Of the areas reserved in South Australia, that on the Coorong is the largest (36,600 acres). It extends from Parnka to the north boundary of the hundred of Duffield, and includes all the waters and islands. Next in extent is Lake Barmera, including Chambers and Nockluna Creeks, on the River Murray, situated between Morgan and Renmark—the area is 4,400 acres. Many water-birds congregate and breed in the reserve. Dangerous Reef, Spencer Gulf, has an area of 100 acres at low tide, and here sea-birds find a home. A large number of Crested Terns (*Sterna bergii*) breed annually on one end of the reef, which is of low elevation; at high tide only 30 acres is above water. The Pages are islands off the eastern end of Kangaroo Island, at the entrance to Backstairs Passage, and are 50 acres in extent. Bushy, Beatrice, and the adjoining islets, near Kingscote, Kangaroo Island, known as the Kingscote Spit, contain 50 acres. They form an exceptionally good breeding-place for sea-birds. Three small islands in Dutton Bay, Eyre Peninsula, comprise an area of 30 acres, while The Brothers, Coffin Bay, with an area of 20 acres, Port Douglas (10 acres), and Goat Island,

Kellidie Bay (5 acres), were proclaimed bird sanctuaries upon representation being made by the South Australian Ornithological Association, on the recommendation of the Royal Australasian Ornithologists' Union. On these islands sea-birds have a haven of rest. Rock-Parrots (*Neophema petrophila*) breed on one or two of the small rocky islets. The Casuarina Islands, off Kangaroo Island, 10 acres in area, complete the list of reserves made under the *Birds Protection Act* of 1900.

The officers of the Commissioner for Crown Lands, assisted by the police, see that the provisions of the Act are carried out in reference to these reserves. The secretary to the Commissioner, Mr. Thos. Duffield, is a zealous officer, who is ever ready to place before his chief the recommendations and particulars relative to areas which should be reserved.

OTHER SANCTUARIES.

The reserves mentioned are not the only areas protected, as extensive tracts of country are either placed under the control of local governing bodies or are supervised by other Government departments, who rigidly protect the birds frequenting them. The Commissioner for Crown Lands has leased all the islands in the Coorong, situated between Woods's Well and Salt Creek, to the South Australian Ornithological Association, with the object of saving the Pelicans. In former years vandals visited these islands regularly and decapitated young Pelicans to secure the one penny a head "blood money." After the islands had been leased to the Association I visited the locality to take them over, and erected notices warning trespassers off. I also arranged for a local custodian; and I am pleased to be able to say that several hundred young Pelicans were hatched out last year. This year, I am informed by the custodian, the birds are again starting to nest. These islands are the only places now in South Australia where Pelicans breed. In the early days they were found in many other localities.

It is hoped that in the near future these islands will become the resort of birds of many species.

In the past the waters of the Coorong teemed with bird-life. Pelicans and Cormorants were present in countless thousands, and fish were abundant. Now that the bird population has been reduced to a minimum, the fish have all but disappeared. Soft sand-crabs, which swarm in the waters, eat the fishes and their spawn. The fishermen's nets also are destroyed by the crabs. This is the result of killing the birds.

BELAIR NATIONAL PARK.

Another good reserve for the native fauna is that at Belair, known as the National Park. In August, 1888, a paper was read before the Field Naturalists' Section of the Royal Society by the late Mr. Arthur F. Robin on the subject of "Native Fauna and

Flora Protection and National Parks." A committee was formed, with Mr. Robin as hon. sec. (Mr. M. Symonds Clark now holds the position) and Mr. Samuel Dixon as chairman. The committee urged the Government to grant an area for a park, and eventually, in 1891, with the help of Mr. Walter Gooch, the efforts were rewarded. An area of 2,000 acres in the Mount Lofty Ranges was proclaimed, and vested in a board of trustees for all time. Since then the National Park has been a source of pleasure to the Adelaide citizens, who journey thither by train on holidays and enjoy a bright day in the hills, where they can observe the birds, but are not allowed to shoot them.

FLINDERS CHASE.

More recently a reserve was proclaimed at the extreme western end of Kangaroo Island, known as the Cape Borda light-house reserve, but which it is proposed to name Flinders Chase, in honour of the navigator, who landed on Kangaroo Island. It is hoped that eventually a larger area will be granted. The lead in securing this reserve was taken by the Native Fauna and Flora Protection Committee, of which I have been an active member since 1895. The South Australian Ornithological Association has also assisted. In 1907 the Price Government granted an area of 60 square miles, and in 1910 the Peake Government granted an additional area of 86 square miles, making a total of 146 square miles. To make the reserve a proper sanctuary at least 300 square miles must be included, and a strong fence and a fire-break, from the north shore to the south, erected; then the birds and animals will be secure. The country for the most part is rough and rocky, with high cliffs facing seaward, unfit for cultivation, and of little use for grazing purposes. There are isolated spots, a few acres in extent, which grow good herbage, but this is needed for native animals.

The South Australian Ornithological Association has already caused a number of Mallee-Fowl (*Lipoa ocellata*) to be liberated in the reserved area. The birds were taken down on different occasions under my personal supervision, and they seem to be doing well. It is hoped that they will breed. The Royal Society is at the present time urging the present Minister for Crown Lands, Mr. F. W. Young, to grant the extended area, and the Minister seems sympathetic, so that there is every reason to believe that at no distant date "Flinders Chase" will be an established fact. It is proposed to vest the Chase in a board of trustees for all time, to prevent the area being reclaimed.

FOREST RESERVES.

Large areas have been set aside as forest reserves in different parts of the State, the total area being 147,084½ acres, over which Mr. Walter Gill, F.L.S., has supervision as Conservator of Forests. In these reserves birds are protected and allowed to breed, only destructive species being killed, under the direction of the care-

takers. The timber trees afford ample shelter to large numbers of birds of many species.

EDUCATING CHILDREN.

Good work is being done in educating the school children in bird-protection. The inculcation of a love for natural objects should tend to make the young people bird-protectors. The Education Department, under the able directorship of Mr. A. Williams, is doing a grand work. "Bird and Arbor Day" combined was instituted several years ago, at first in connection with a few schools, but now it is universal in the State. A nature study school in connection with the Education Department is also doing good work. At the head is Mr. A. G. Edquist, who is an enthusiastic and energetic worker. He comes in touch with the practical side of things, being a member of all the societies which have for their object the study and protection of our native fauna and flora. With the object of assisting him, the South Australian Ornithological Association gave a challenge cup, known as the "Bird and Arbor Day Cup," to be competed for annually by the public schools throughout South Australia. The winning school holds the cup for twelve months. The first to gain the trophy was a small country school at Narridy. The essay competitions are making the school children generally observant.

The inauguration of the Gould League for the Protection of Birds marks an epoch in bird-protection. In South Australia 301 schools have started branches, and no fewer than 9,000 children have enrolled as members and become active bird-lovers. Prominent ornithologists form the committee.

It is gratifying that the Ministers of the Crown, both in the Education and Crown Lands Departments, are fully alive to the need of bird-protection, and have helped the cause. Praise is due to Mr. Crawford Vaughan, who, while Commissioner for Crown Lands, supported bird-protection by granting sanctuaries and placing useful species upon the totally protected list. Mr. F. W. Young, the present Commissioner, has also a kindly feeling towards bird-life, and it is to be hoped that he will show it in a practical way.

A LOCAL BIRD BOOK.

Mr. Thos. Duffield has also urged upon his Minister the advisableness of gathering knowledge on useful birds and disseminating it among the people. He compiled a valuable little book upon "The Protected Native Birds of South Australia," with an introduction and descriptive matter by Mr. A. G. Edquist. The book has excellent coloured plates, and has done much to interest the people in native birds.

Many private persons strictly protect bird-life on their estates, and see that the law is not infringed in their respective districts, while public bodies are also vigilant in securing protection on the lands under their control. The press is sympathetic; and, altogether, the future of bird-protection appears to be bright.

Flinders Island Camp-out.

By J. W. MELLOR AND (CAPT.) S. A. WHITE, Ms.R.A.O.U.

At the conclusion of the annual congress a number of the delegates proceeded to Cape Barren Island, arrangements having been made to hold a ten-days camp there and on Flinders Island.

After landing a party on Cape Barren Island on the afternoon of 20th November, under the charge of Mr. A. H. E. Mattingley, the steamer *Yambacoona* headed round Long Island, which lies between Cape Barren and Flinders Islands, and made a course for Lady Barron, on the south-eastern shores of Flinders Island. The destination was reached at 6 p.m., but, as the hour was too late for disembarking on an unknown shore and erecting tents, &c., in the dark, arrangements were made to spend another night on board the vessel. A reconnoitring party, under the direction of the leader of the Flinders Island camp, Mr. J. W. Mellor, went ashore in the ship's boat. A snug spot was selected for the camp on a point of land in Petrification Bay, an inlet of Adelaide Bay, and near Opossum Boat Harbour. The locality is thickly bushed with small trees and other vegetation, affording shelter from storms.

Next morning the officers of the *Yambacoona* and members of the party were early astir. The luggage and supplies were piled into the boats, which were bobbing about like corks on the sea, and in due course the packages were safely landed. The weather being fine, the task of "pitching" camp was soon accomplished. Breakfast was prepared by the cook and his assistant—half-castes brought over from Cape Barren Island settlement. The camp consisted of seven tents.

As soon as the camp appointments had been completed the ornithologists and others settled down to systematic work. The leader and Captain S. A. White (S.A.) undertook the investigation of the bird-life of the island. Dr. C. S. Sutton (Vic.) paid attention to the botany. (He identified over 300 species of plants.) Dr. J. Burton Cleland (N.S.W.) collected parasitic worms from the intestines of birds, reptiles, and other creatures, and parasitic insects, and Mr. F. M. Angel (S.A.) acted as general entomologist. There were also in camp Messrs. J. W. Hosking (S.A.), E. Bewes (S.A.), Mesdames S. A. White (S.A.), J. W. Israel (Vic.), and Misses R. Toms (S.A.) and E. McDonald (Tas.) Reveille was sounded each day at 6 a.m. Breakfast hour was 7 a.m., dinner 1 p.m., and tea 7 p.m., and the time was fully occupied every day. The country around the camp proved most interesting, being extremely diversified in character: swamps extending over miles of country; undulating ridges covered with dwarf eucalypts and shrubs; "blackboy" country, where grass-trees (*Xanthorrhæa*) of huge size raised their heads above "heath;" and, farther afield, lofty ranges with rough and rugged peaks 2,500 feet above sea-level. The country generally was clothed in bracken fern, growing in some parts to the height of 6 or 7 feet, and it was with difficulty

that passages were forced through the dense thickets. Kangaroos and wallabies were sometimes disturbed.

A party was formed to visit the lofty Strzelecki Ranges; it consisted of Messrs. J. W. Mellor and F. M. Angel, Drs. C. S. Sutton and J. Burton Cleland. Messrs. H. J. and Wm. Holloway assisted by providing transport facilities for food and impedimenta necessary for a trip of several days' duration. Approaching the ranges, which lay about 12 or 14 miles from the main camp, the party met with some fine forest country, thickly timbered with giant blue gums (*Eucalyptus globulus*). Bush-fires had been raging, and many of the splendid trees were dead. The ascent of the Strzelecki peaks was made on the day after leaving camp, but the summits were found too barren and weather-worn to form protection for bird-life, which was more plentiful in the ravines and sheltered spots at the base of the ranges. The ornithologists did some good work in observing the birds and taking notes upon their habits. Some members of the party arrived back at the main camp late next day, a forced march of over 20 miles being made through rough country. The others returned a day later, having spent more time on the "Peaks of Flinders," camping at a "humpy" on the track for the night.

One day was spent about the islands in Franklin Sound for the purpose of studying the sea-birds which abound there, Mutton-Birds (*Puffinus tenuirostris*) being found in vast numbers, while on Rabbit Island the White-faced Storm-Petrel (*Pelagodroma marina*) was nesting. Pacific Gulls (*Gabianus pacificus*) and Silver Gulls (*Larus novæ-hollandiæ*), Oyster-catchers, and other birds were also found breeding.

It was clear that as Flinders Island becomes settled many birds will be driven from their haunts, if not altogether disappear.

The weather was decidedly moist during the camp-out, rain falling nearly every day. The stormy conditions made the scientific work extremely difficult. However, the ornithological members of the party were able to identify between 50 and 60 species of birds, the majority being identical with Tasmanian forms. The predominance of Tasmanian species indicated that Flinders was joined to Tasmania at a more recent date than to the mainland of Australia. The investigations of the botanists strengthened this opinion, as, out of over 300 species of plants identified, all but a few were members of the Tasmanian flora. On the night of 27th November the *Yambacoona* steamed into Lady Barron harbour and cast anchor. Next morning, after breakfast, camp was struck, and before noon everybody and everything were on board, and the *Yambacoona* was steaming down the passage to Cape Barren Island settlement, where the members of the other camp were waiting to embark. The sky was stormy, and the vessel had barely gained the shelter of the Tasmanian coast when the wind veered round and a heavy sea arose. The *Yambacoona* reached Launceston wharf shortly before 10 a.m., after discharging cattle lower down the Tamar River.

Thanks are due to Mr. H. J. Holloway and his brother, Mr. William Holloway, for the services which they rendered to the camping parties. Settlers on Flinders Island also gave valuable assistance. Mr. F. M. Littler arranged for supplies for both camps, and the forethought he displayed is to be commended.

Subjoined is a detailed account of the birds identified:—

Synœus diemenensis. Tasmanian Brown Quail.—About half a dozen specimens were flushed from the tussock grass on Rabbit Island, Franklin Sound. Although no actual birds were procured, there is not the slightest doubt as to their identity. They were seen at very close quarters.

Turnix varia. Painted Quail.—Hearing a booming call it was taken for that of the Bronze-winged Pigeon, but, after beating the low scrub and grass, a Quail was flushed and shot, proving to be *Turnix varia*. On comparison with Australian skins, it is found to be very much darker throughout—feet much larger, and scales on same of a different shape; tarsus, $\frac{1}{16}$ of an inch longer; middle toe, $\frac{3}{8}$ of an inch longer.

Phaps elegans. Brush Bronze-wing.—A bird answering to the description of the Brush Bronze-wing ran along the ground, following a path from the beach into the scrub, only a few yards in front of one of the writers. Not numerous. One seen on the way to Strzelecki Ranges.

Eudyptula minor. Little Penguin.—These birds were found breeding on most of the small islands around the coast of Flinders Island. Eggs, fresh, to young just leaving the nest were observed.

Pelagodroma marina. White-faced Storm-Petrel.—Found in numbers breeding on Rabbit Island, Franklin Sound. Every burrow contained a bird, eggs fresh or slightly incubated. When taken from their nesting burrows and thrown into the air, the birds, in all cases, sank into the long grass where their burrows were located, and made a very feeble, if any, attempt to fly off. Out of five specimens taken from the burrows, three were males and two females.

Puffinus tenuirostris (brevicaudus). Short-tailed Petrel.—Nesting on all the islands in Franklin Sound. Laying had only just begun, for in all instances eggs were fresh, and of the birds sitting males seemed to predominate.

Diomedea cauta. White-capped Albatross.—Seen a few miles from Flinders, between that island and Tasmanian coast.

Sterna bergii. Crested Tern.—In numbers in Franklin Sound. Breeding on small islands, eggs partly incubated.

Sterna nereis. White-faced Ternlet.—Two birds observed.

Larus novæ-hollandiæ. Silver Gull.—Seen in great numbers following the shipping. Some were nesting on rocky islets in Franklin Sound.

Gabianus pacificus. Pacific Gull.—Found nesting in numbers on all the small islands in Franklin Sound. Incubation slight to well advanced.

Hæmatopus longirostris. Pied Oyster-catcher.—Seen on the sandy beaches of Flinders Island, and on the rocky islets of Franklin Sound, where they were breeding.

Hæmatopus fuliginosus. Black Oyster-catcher.—Rather numerous. Several nests containing eggs were observed.

Ægialitis ruficapilla. Red-capped Dottrel.—On the beaches in company with Stints.



Young Black Oyster-catcher (*Hæmatopus fuliginosus*).

FROM A PHOTO. BY A. H. E. MATTINGLEY.



Nest and Young of Gannet (*Sula serratov*).

FROM A PHOTO. BY A. H. E. MATTINGLEY

Heteropygia acuminata. Sharp-tailed Stint.—Numbers of these little birds were seen feeding amongst the green sea-weed at low tide.

Notophox novæ-hollandiæ. White-fronted Heron.—Seen inland on the swamps as well as on the sea-shore.

Botaurus pœciloptilus. Bittern.—A Bittern was heard booming on Flinders Island, both by night and day, but was not procured. This bird seemed to feed on the sea-shore during the night, and in the day time retired to the thick scrub growing in the swampy country inland.

Chenopsis atrata. Black Swan.—Several of these fine birds were seen flying over the camp.

Cereopsis novæ-hollandiæ. Cape Barren Goose.—One of these fine birds was flushed from a small islet in Franklin Sound. Broken egg shells were seen, showing that these birds breed on the small islands of the Sound, if undisturbed.

Anas superciliosa. Black Duck.—A good many of these Ducks were seen, also large young, on several occasions, on swamp in the interior of the island.

Biziura lobata. Musk-Duck.—Many of these birds were seen in the waters of Franklin Sound.

Phalacrocorax gouldi. White-breasted Cormorant.—Great numbers were seen on all the rocky islets in Franklin Sound.

Sula serrator. Gannet.—Numbers observed fishing in the waters between Flinders Island and Tasmanian coast; nesting on Cat Island, but not in such large numbers as in December, 1908, when fresh eggs to large young were found. On this occasion only fresh eggs were found.

Pelecanus conspicillatus. Pelican.—A few Pelicans were seen in the bays and coves of Franklin Sound.

Aquila audax. Wedge-tailed Eagle.—One or two observed on Flinders Island.

Falco melanotus. Black-backed Falcon.—Two of these beautiful new Falcons were seen, and one, a female, was secured. (See description, p. 164.)

Hieracidea berigora. Striped Brown Hawk.—A specimen procured by Dr. J. Burton Cleland was certainly more like *H. occidentalis* than *H. berigora*. The bird was very light and striped on the breast.

Circus assimilis. Swamp-Hawk.—There being many large lagoons and much swampy ground on Flinders Island, it was an ideal habitat for the Swamp-Hawk, and a good many were observed.

Haliaetus leucogaster. White-bellied Sea-Eagle.—A pair was seen flying round the islands in Franklin Sound.

Ninox maculata. Spotted Owl.—There seemed to be a fair number of these birds on the island, judging by their calling every night, close to camp.

Calyptorhynchus xanthonotus. Yellow-eared Black Cockatoo.—Black Cockatoos were seen several times on Flinders Island, and one was procured on Cape Barren Island.

Platycercus flaviventris. Green Parrot.—These Parrots were fairly plentiful in the timbered country on the island.

Lathamus discolor. Swift Parrot.—Noticed in fair numbers in the large blue gum country at the foot of the Strzelecki Ranges. They were flying high, and some settled in the topmost branches of tall trees. One was secured for identification.

Cuculus pallidus. Pallid Cuckoo.—Pallid Cuckoos were heard on several islands as we passed in the steamer, and they were fairly plentiful on Flinders Island.

Cacomantis flabelliformis. Fan-tailed Cuckoo.—These Cuckoos were extremely plentiful, and could be heard calling in every direction.

Chalcococcyx basalis. Narrow-billed Bronze-Cuckoo.—Although this bird seems to answer to the description to a certain extent, still there are some differences, and it would be hard to determine without further material.

Hirundo neoxena. Swallow.—Observed about homesteads.

Petrochelidon nigricans. Tree-Martin.—Tree-Martins were numerous in the timbered country, and more numerous near swamps and lagoons. However, no specimen was procured.

Petroeca vittata. Dusky Robin.—These birds were numerous in the thick scrub as well as close to the sea-shore. We found them breeding, and in all stages from fresh eggs to fully fledged young. A favourite situation for the nest was in the upturned roots of large gums. On comparison with Tasmanian birds it was found to be much darker throughout.

Petroeca leggii (frontalis)* Scarlet-breasted Robin.—These birds were moderately numerous, and met with only some distance inland.

Petroeca phoenicea. Flame-breasted Robin.—Fairly plentiful. This inland form appeared much lighter, both above and below (perhaps due to time of year) than the Tasmanian bird.

Pachycephala glaucaura. Grey-tailed Thickhead.—Fairly numerous on the island. Several males in adult plumage were calling loudly.

Pachycephala olivacea. Olive Thickhead.—Few in number; birds both in adult and immature stages were observed.

Rhipidura diemenensis. Dusky Fantail.—These restless little birds were found in numbers on the island. A pair had a nest with three fresh eggs, situated immediately over one of the tents.

Graucalus parvirostris. Small-billed Cuckoo-Shrike.—Met with in pairs, and from the well-worn state of their plumage apparently they had finished nesting some time previously. There is little or no variation between these birds and the Tasmanian specimens.

Epthianura albifrons. White-fronted Bush-Chat.—Numerous. The islands may have been stepping-stones by which this bird found its way from the mainland to Tasmania. The island birds show no variation from mainland birds.

Megalurus flindersi. Flinders Grass-Bird (for description see page 164).—Although not plentiful, on several occasions seen amid thick undergrowth in swampy localities.

Acanthiza ewingi. Ewing Tit.—Like Tasmania, Flinders Island abounds with this Tit. It was found in every conceivable situation, and their sharp little twitter was ever sounding in our ears.

Sericornis flindersi. Flinders Scrub-Wren (for description see page 165).—That Flinders Island yielded a new *Sericornis* is not a surprise, when so many of the islands in Bass Strait have their own varieties of this widely dispersed genus. Not numerous. Found in the thick undergrowth on mountain sides and in the deep gullies.

* This bird answers well to G. M. Matthews' description, and both this and the Tasmanian bird are smaller than the New South Wales specimen.—S.A.W.



Dusky Robin (*Petræca vittata*) and Young.

FROM A PHOTO. BY A. H. E. MATTINGLEY.



White-breasted Cormorants (*Phalacrocorax gouldi*).
Immature Birds.

FROM A PHOTO. BY A. H. E. MATTINGLEY.

Malurus samueli (Mathews, *vide A. A. Record*, No. 4, vol. i., p. 93). Flinders Blue Wren.—Blue Wrens were plentiful amid the thick undergrowth on the borders of swampy ground, and in the tangled mass of giant bracken on the hill and mountain sides. Colour of mantle and crown of head is a distinct shade of blue to *M. cyaneus*. Found nesting; egg fresh. Nests much more open at entrance, and larger in bulk in comparison with those of other members of the genus.

Zosterops lateralis.* Southern White-eye.—Were very plentiful, and were observed tripping over the ground amongst low berry-producing plants; at other times seen diligently searching for insects amid the stunted gum (eucalypt) and other bushes.

Pardalotus affinis. Yellow-tipped Pardalote.—Numerous on Flinders Island. Met with in the big timber and scrub country alike.

Pardalotus punctatus. Spotted Pardalote.—This Pardalote was not so numerous as the preceding species; found in stunted gums (eucalypts).

Melithreptus validirostris. Strong-billed Honey-eater.—These birds were met with in the large timber on mountain sides, and were in small companies from three to six, flying from tree to tree. Unlike that of *M. gularis*, of the mainland, their call is feeble and not often repeated.†

Melithreptus melanocephalus. Black-headed Honey-eater.—Met with in low dwarf eucalypt scrub. Very silent birds, and not at all plentiful.

Acanthorhynchus dubius. Tasmanian Spinebill.—Spinebills were scarce, although it was apparently an ideal country for them, because low flowering shrubs and grass-trees abounded.

Glycyphila crassirostris. Tasmanian Tawny-crowned Honey-eater.—Although a fair number of these birds was noted, their characteristic call was seldom heard. Many fully fledged young were seen, which were adorned with a bright yellow throat. Found in swampy country.

Ptilotis flavigula. Yellow-throated Honey-eater.—This fine Honey-eater was fairly numerous, and its somewhat frog-like call was often heard in the thick undergrowth. In habits it much resembles *P. leucotis* of the mainland.

Lichmera australasiana. Crescent Honey-eater.—The loud, well-known call of the Crescent Honey-eater was heard amid the thick undergrowth in swampy places. A specimen was not procured, but there is little doubt of it being the Tasmanian variety.

Meliornis novæ-hollandiæ. White-bearded Honey-eater.—Thinly distributed over the island; frequents banksia trees near swampy localities.

Anthus australis. Pipit.—Thinly distributed over the island. Specimens were secured, as expected, much darker on the back and darker marked on the breast in comparison with those from Australian specimens or more open localities.

Zonæginthus bellus. (?) Fire-tailed Finch.—On comparison it is found that this Flinders Island bird resembles the one on Kangaroo Island (*Z. bellus samueli*, Mathews, *A. A. Record*, vol. i., No. 4, p. 102) in general colouration, but the shade of crimson on rump is decidedly lighter than the

* I have minutely examined a large series of *Zosterops* from South Australia, Kangaroo Island, Tasmania, and Flinders Island, and I am of the firm opinion that *Z. lateralis*, *Z. westernensis*, *Z. tasmanica*, and *Z. halmaturina* are not separable.—S.A.W.

† I located a nest at a great height in the thick young shoots (which had grown after fire) of a blue gum (*E. globulus*). After a stiff climb I found that it contained two young birds almost naked, only a scanty covering of brownish down. Nest placed close to limb, composed of grass, leaves, rootlets, and bark fibre.—S.A.W.

Kangaroo Island or Tasmanian bird. The latter shows a consistent brown colouration of upper parts, which is wanting in both of the smaller island forms.

Corvus australis (*tasmanicus*). Tasmanian Raven.—Many Ravens were seen flying high over the island. As soon as specimens were secured Mr. Mathews was supported in his making a sub-specific distinction, because the great size of the bill is evident at once in the Tasmanian form.

Strepera arguta. Hill Crow-Shrike.—Not numerous, and were very shy.

Collyriocincla rectirostris. Whistling Shrike-Thrush.—Fairly numerous on the island; call and habits seem identical with the Tasmanian bird.

[Gould procured the Ground-Parrot (*Pezoporus formosus*) on Flinders Island, and the party of the Field Naturalists' Club of Victoria observed the Pink-breasted Robin (*Petroeca rhodinogastra*), 1893. Neither of these birds appears to have been seen by the present expedition. No doubt a *Calamanthus* and the Emu-Wren are also found there.—EDS.]

Descriptions of Three New Birds.

BY (CAPT.) S. A. WHITE AND J. W. MELLOR, Ms.R.A.O.U.

THE following are descriptions of three new species of birds obtained during the working camp-out of the R.A.O.U. on Flinders Island (Furieux Group), Bass Strait, during November, 1912:—

Falco melanotus (Black-backed Falcon), sp. nov.

Adult Female.—Forehead, crown of head, cheeks, ear coverts, and all the upper surface glossy black; primaries dull black, with exception of tips, and marked on the internal webs with oval spots of brown; two centre tail feathers almost black, with very indistinct markings of bluish-grey; remaining tail feathers black, marked with many spots (in some cases almond-shaped) of reddish-brown, all slightly tipped with buff; throat and head yellowish-white, some of the feathers of the latter slightly marked with black. All the under surface a rich rufous colour, many of the feathers marked down the centre with black, feathers on flank and thighs blotched strongly with black, upper tail coverts bluish-black, tipped with bluish-grey, centre of tail feathers marked with black. Iris brown; bill horn colour, black at tip; feet grey, nails black. Total length, 13 inches; wing, 10 inches.

Habitat.—Flinders Island (Furieux Group).

Megalurus flindersi (Flinders Grass-Bird), sub-sp. nov.

Adult.—Upper surface dull brown, feathers of the mantle centred with dull black, marged with brown, turning into rufous-brown on the rump, where the black centre disappears. Primaries blackish-brown; secondaries becoming darker and narrowly edged with light brown on outer edge. Forehead dull rufous-brown, a line over the eye dull white; ear coverts dull white. Under surface dull greyish-white; chin, throat, and breast mottled, owing to the feathers having a small elongated central spot of dark brown; centre of abdomen dull greyish-white, passing into a rufous tinge

on the under tail coverts, the longer feathers having a dull brown centre; flank rusty-brown, some of the feathers having a broad blackish-brown central stripe. Tail dull brown, with darker brown shafts, the large centre feathers being very pointed at the tips. Iris dark brown, bill brown, feet horn.

Dimensions in inches:—Total length, 4.94; bill, .60; wing, 2.10; tail, 2.25; tarsus, .78.

Habitat.—Flinders Island (Furneaux Group). Inhabiting swampy and marshy land, where the birds keep closely to the bushes, and utter a plaintive three-note call.

Sericornis flindersi (Flinders Scrub-Wren), sub-sp. nov.

Adult Male.—Head, back of neck, back, and wings dark brown; rump and tail reddish-brown, spurious wing feathers black, strongly tipped with white, the centre of a few feathers faintly marked with brown; cheek and abdomen dull white, passing into yellowish-brown on the flanks; lores black; under tail coverts brown, tipped with white. Bill and feet brown.

Dimensions in inches:—Total length, 4.5; bill, .62; wing, 2.25; tarsus, .88.

Habitat.—Flinders Island (Furneaux Group).

Description of a New Cuckoo.

BY ALAN P. DODD, R.A.O.U., NELSON (N.Q.)

Cacomantis lineatus (Barred Cuckoo), sp. nov.

Female.—Back and upper wing coverts dark sub-metallic olive-green, each feather crossed with an irregular V-shaped light buff bar; primaries and secondaries slightly toothed with light buff. Head black, pencilled with rufous; the head colouration, when examined closely, contrasts with that of back. Upper tail coverts and tail dark sub-metallic olive-green, more or less toothed with rufous. Under surface of wing has an oblique white bar. Under wing coverts white, each feather with a single V-shaped dark sub-metallic olive-green bar. Throat dark sub-metallic olive-green barred with rufous, the centre of each feather pencilled with white. Lower throat similar, but the rufous colouring becomes paler, and on the chest blends into white. Towards the tail the white bars broaden, until on the abdomen the feathers have more white than olive-green. The bars of adjacent feathers not being symmetrical, the under surface does not show a uniform barred appearance as in *Chalcococcyx*, but is more marbled. Under tail coverts white, with five dark olive-green bars. Upper mandible blackish; lower mandible yellow, except the tip, which is blackish; gape yellow.

Dimensions in inches:—Length, 8; tail, 3.75; bill, 0.5.

Owing to the peculiar varied colouration of this bird, it is difficult to describe it accurately. The colouration reminds one

to a certain extent of that of the *Podargi*. It is noticeable that, while the feathers of the head are chiefly black, the general colour of the rest of the feathers is not black, but a dark shade of olive-green. The colour at first sight appears blackish-brown, but a closer examination shows that there is a green tinge in it, as well as a sub-metallic lustre. Another thing worth noticing is that the bars on the feathers of the back and on the upper wing coverts are light buff, while on the feathers of the head and throat, and on the upper tail coverts and tail feathers, they are rufous.

This beautiful and elegant Cuckoo was first observed devouring caterpillars on low bushes in forest country near Nelson. I had no gun handy, but, returning to the place the same day, I fortunately secured the bird. This was during the first week of September, 1912. About the same time there appeared to be three other specimens, but they probably belonged to the Square-tailed species (*C. flabelliformis*, Lath.), which could easily be mistaken for *C. lineatus* at a distance, though there is little resemblance between them when seen at close quarters. With the exception of the members of the genus *Chalcococcyx*, *Cacomantis lineatus* is the most beautiful of Australian Cuckoos, and it is somewhat remarkable that so distinct a bird has not been discovered sooner. The new bird was secured close to the town of Nelson, and within 12 miles of the port of Cairns.

Description of New Grass-Wren.

BY J. W. MELLOR, R.A.O.U., ADELAIDE.

Amytornis merrotsyi (Chestnut-mantled Grass-Wren), sp. nov.

Specimens of a new species of Grass-Wren (*Amytornis*) have been forwarded to me by Mr. A. L. Merrotsy, who collected them in the spinifex or porcupine-grass country to the north-east of Lake Torrens. The male, female, and eggs have all been secured. From its striped appearance it is nearly related to the Striated Grass-Wren (*A. striatus*). The most conspicuous character, apart from the striation, is a light rufous or chestnut colouration of the head and mantle. The bird can be at once distinguished from the Striated Grass-Wren by the large amount of rusty-chestnut on the head and mantle, the absence of black beneath the eye and on the ear coverts, and by its much shorter tail. The feet and legs are larger and stouter.

Descriptions are as follow :—

Male.—Upper surface bright rusty-chestnut, especially on the head and mantle, all the feathers having a conspicuous line of white down the centre, the white being bordered on each side by a narrow line of black, which throws the white streak more into prominence. Feathers of forehead short, stiff, narrow and bristle-like, white striped

with black edgings; the ear coverts are similar in colour but longer; chin buffy-white. Throat, chest, and sides of breast feathers striped with dull white, on each side of which is a narrow line of dull brown, and edged again with dull white. On centre of breast patch of uniform creamy-buff. Flanks, abdomen, rump, and under tail coverts light brown. Wings brown, the primaries having buff shafts, and a portion of the outer web chestnut, forming a conspicuous patch of that colour in the centre of the wing. Secondaries and greater wing coverts with buffy stripe down entire centre, and edged with narrow margin of the same colour, which becomes more chestnut as the smaller wing coverts are reached; under wing coverts buff. Tail brown, each feather margined with dull buffy-brown, and slightly tipped with the same colour, the shafts being rusty-brown; shape of each feather being somewhat narrow, and pointed at the tip. Bill dark horn; feet dark horn.

Female.—Much the same colouration throughout, the rufous on the mantle, &c., being slightly lighter, also a little more rufous on the greater wing coverts; shoulders have a wash of the same colour, while the under surface indicates less striation and more rufous wash all over the breast. All the tail feathers have a distinctly light buffy-brown line down the centre.

Measurements in rooth parts of inch:—Male.—Total length, 610; bill, 60; wing, 260; tail, 320; tarsi, 110, and stout. Female.—Total length, 580; bill, 54; wing, 230; tail, 280; tarsi, 110.

Nest.—Domed and loosely constructed of dry spinifex grass, lined with rabbits' fur. Built in spinifex-grass bush. Eggs.—Two form clutch; shape—somewhat elongated, equally rounded at both ends, the ground colour being pearly-white, uniformly dotted and marked with various-sized, irregularly-shaped splashes of reddish-brown, the marking denser at the extreme larger end. Dimensions in rooth parts of inch:—(a) 88 × 60; (b) 88 × 60.

New *Acanthiza*.

BY ALEX. W. MILLIGAN, R.A.O.U., MELBOURNE.

Acanthiza pygmaea, sub-sp. nov.

The above new sub-species was discovered in the Mallee district of Victoria by Mr. Leslie G. Chandler in October, 1912, when collecting for Mr. H. L. White, of Belltrees, Scone, N.S.W., and I was permitted to examine it in connection with my monograph, in preparation, on the *Acanthizæ*. This is the smallest of all the genus, and, for that reason, I propose the trivial name of Fairy Tit. It closely resembles *Acanthiza mathewsi*, Hartert, from which it does not differ to any material extent in either the colour or pattern of its plumage. Its miniature proportions,

however, as regard total length, bill, tarsi, tail, and wings, and its very slender tarsi and very short, fine bill, at once distinguish it from *Acanthiza mathewsi*. The sexes can be distinguished only by dissection. The measurements in millimetres of a series of two adult males and one adult female are as follow :—

| | | Total Length. | | | Wing. | | Culmen. | | Tarsus. |
|-----|---|---------------|----|-----|-------|-----|---------|-----|---------|
| (a) | ♂ | ... | 90 | ... | 51 | ... | 8 | ... | 17 |
| (b) | ♂ | ... | 92 | ... | 49 | ... | 8 | ... | 17 |
| (c) | ♀ | ... | 88 | ... | 51 | ... | 8 | ... | 18 |

Bill and feet black. Irides brown.

Type, Belltrees collection.

Field Notes on the Emu-Wren (*Stipiturus malachurus*).

By (Miss) J. A. FLETCHER, R.A.O.U., SPRINGFIELD, TASMANIA.

(Read at the Launceston Session, R.A.O.U., 18/11/12).

EMU-WRENS (*Stipiturus malachurus*) are fairly common in the Springfield (Tas.) district. As a general rule, each pair of birds has its own haunt throughout the year; but I have seen as many as five Wrens together in the autumn. Probably three were the young of the last season, which had not been driven away by their parents. The rustling noise which these birds make when creeping through the rushes betrays them long before their "Tit-like" call is heard. When feeding quietly together their twittering notes resemble those of the *Acanthiza*, but the song of the male is a feeble edition of the *Maluri* notes. The warning call, again, is similar to that of the Tasmanian *Acanthiza*.

This season (1912) I have made some rather interesting notes regarding the Emu-Wrens. The female, as far as I have observed, does all the work of nest-building, gathering and arranging the material. Generally speaking, she is a slow builder if it be the first nest of the season which she is constructing. If she has lost her first nest she rebuilds and has a completed clutch of eggs in a fortnight's time. The male follows the female as she collects the grass and other material, and flies with her towards the nesting-site, but does not assist her. The female rolls the grass or other material into a neat bundle, and does not have it hanging loosely from her beak. She drops into the centre of a tussock, and emerges from one side, repeating the action in tussock after tussock until the chosen one is reached. With two exceptions the nests found or observed by me this year were placed in sword-grass tussocks, right down in the centre or just at the side. The principal grass used in the construction of the nests was meadow-fog, which is soft and pliable. Some of the nests had a capping of green moss. One was warmly lined with fur, and several were made cosy with feathers. The nest cavity was shallow, except in one instance, where the nest was built among reeds growing

in deep water. "The female lays one egg each day, and sits on the day when the last egg is deposited.

If disturbed while brooding, the female drops from the nest after the manner of a fledgling, and secretes herself in the nearest tussock. However, if the observer remains quiet she soon returns and enters the nest again. Emu-Wrens take no notice of the human voice; it is movement which they distrust. On 31st August, 1912, I saw a female Emu-Wren, carrying material in her beak, disappear in a large clump of coarse rushes, locally named "wild pampas." I could not find the nest then, nor on a second visit a week later. On the evening of 19th October I disturbed the birds near the same spot, and judged by their actions that they had fledglings somewhere. I was unable to stay, but early next morning my sister and I cycled to the swampy creek. Shortly afterwards we saw the male Wren fly from the bank with an insect in his bill. He disappeared in the same rushes. I left my sister to watch, while I examined a nest of Lewin's Rail (*Hypotaenidia brachypus*). The female Emu-Wren flitted past me, carrying food. I returned to the bog where I had left my sister. She reported that the male bird had disappeared and returned again, this time carrying a spider. The birds now became aware of our presence, and made a great commotion. The male appeared to decide that all was well, and entered into a sword-grass tussock. Then we heard young ones crying. The male flew away. The female, after feeding the young birds, also left.

After some trouble, we found the nest. It was situated in a small tussock near several larger clumps on the edge of a sheep-track running through the bog. The young birds were about a week old. They kept their eyes closed. The feathers were showing on the wings, displacing the long blackish hairs or down. The fledglings paid no attention when a hand was held above them; but instantly the reeds rustled they became alert. The parent birds soon returned, and crept to within a few inches of us. The female, whose beak already held insects, began picking scale off the reeds without losing any of her former captives. On making a second visit to the locality we found that the male bird had gained more confidence; he fed two of the fledglings.

Next evening I watched the birds for a while from my seat on a tree-fern stump a foot or two from the nest. The male appeared first, bringing in his beak a brown moth nearly as big as himself. But he saw the camera, which I had not had time to conceal. Round and round he hopped, up and down the rushes, across the sheep-track, and up to the nest. An hour elapsed before he fed one of the fledglings, and departed in search of more food. The female, meanwhile, had shown no fear except for a few minutes. She fed her young ones freely, each in turn. On the reeds near me she found a soft-bodied, greyish-coloured insect, which she seized and popped into a little beak. I examined the fledglings. Their eyes were wide open. The feathers were

developing on other parts of the body as well as the wings, and the bluish and rufous tinges were showing on throat and chest respectively. Two days afterwards I again visited the nest; it was empty. A little later I saw the young birds being fed by their parents.

On 29th September the nest (partly built) of another pair of Emu-Wrens was found in a sword-grass tussock on the edge of a swampy creek. By 19th October it contained one egg; but the owners subsequently deserted the nest, owing, perhaps, to the presence of some fencers who were working near. On 17th October I cycled to the Brid River flats to look at an Emu-Wren's nest, which had been found by one of my scouts. The nest was placed in the favourite grass against a log lying in a swampy creek which flowed into the river. The female emerged as I walked along the log, and secreted herself in the next tussock. I followed her, and she flitted to the lowest twig of an aster bush. Thus I was able to fully identify her. Two weeks previously I had discovered what was evidently the first nest of this pair of birds. The swamp in which it was situated was the scene of a fire, and the nest was burnt. Subsequently nests were found on 19th and 30th October. The former contained three fresh eggs, and was built in round reeds in the bed of a creek. One nest, discovered on 30th October, contained two eggs; it was built at the base of thick round reeds. On 5th October an Emu-Wren (female) was noted collecting material from the bank. On 24th October my scout found the nest, which was nearly finished, by observing the female carrying material. The nest contained three eggs by 30th October. It is worth mentioning that this swamp was burnt out by the farmer who owned it.

The nesting season of the Emu-Wren is more extended than is generally supposed, nests with full clutches of fresh eggs having been found on 6th, 7th, and 20th November. On the latter date a nest containing two eggs and a nest partly built were also noted. Pairs of birds have been seen in October with their young flying around them. The markings of the eggs vary somewhat. There is generally an odd one in the set. Following out some directions which I had given to her, my scout, on 29th October, succeeded in finding the home of another pair of birds. It contained two young ones, just hatched. They were naked; eyes closed. Four days afterwards greyish-black down was observed on wings, head, and part of back. The feathers were just showing on the wings. When next I visited the spot I found the young birds lying dead in the nest, with their backs torn.

Lady Collector.—Permission has been granted by the Commonwealth Government to Miss Audrey Chirnside, of Melbourne, to export specimens of birds, &c., collected by her in the several States for the Natural History section of the British Museum, London.

Occurrence of *Cisticola* in Tasmania.

BY (MISS) J. A. FLETCHER, R.A.O.U., SPRINGFIELD, TASMANIA.

SINCE September, 1911, observations have pointed to the existence of *Cisticola exilis* in the Springfield district, Tasmania.

A few days prior to 25th September a schoolboy informed me that he had found, in a tussock, a nest containing three blue-coloured eggs. I asked him whether he could find it again. He said that he did not think so, as he had come upon it suddenly while hunting for cows, and had not taken notice of the surroundings. This reminded me that, on 1st March, 1911, I had flushed a small bird on the grassy flats of the Brid River. When the bird flew I had said to myself, "A *Cisticola*!" then "Rubbish! these birds are not found in Tasmania." Some little distance away I saw some Emu-Wrens (*Stipiturus malachurus*), and thought that I might have mistaken one for a *Cisticola*, though their actions were so different from what I remembered of the *Cisticola* in Queensland.

A few days afterwards a young lady asked me whether I did not think that the "Marsh-Bird" laid pretty eggs. I replied, "Yes, a purplish-brown," thinking it was the *Calamanthus* she was referring to. "Oh, no!" she said, "I mean the other 'Marsh-Bird.' It builds a small nest, low down, and lays three or four blue eggs, with reddish spots towards one end." Further questioning revealed the fact that she had found, some years ago, two nests. Her family always called the birds "Hedge-Sparrows" or "Marsh-Birds" with the drooping tail, to distinguish them from the *Calamanthus*, locally called the "Cocktail." I determined to hunt for the bird; but it was 19th November before my sister and I flushed one and followed it across a grassy, dry swamp. This year (1912) both my sister and I have seen the bird several times; but I have not yet been able to obtain a specimen. The bird appears to be slightly larger than the specimen in the Hobart Museum, and the plumage a deeper brown; but it resembles the figure in Dr. J. A. Leach's "Australian Bird Book." The bird is not very common; but the grassy flats in this district are of no great extent.

In October, 1911, the schoolboys at South Springfield were asked whether they had ever found a bird's nest something like a Wren's, but containing eggs of a blue colour. Three boys answered "Yes," and one boy said, "But, teacher, the eggs have reddish-brown spots upon them at one end." This confirmed previous statements. On 2nd November, 1912, I was told that a "Marsh-Bird" had reared a brood in a small clump of blackberries. The nest was found when new; it contained three blue eggs with reddish spots. The young were reared. I took the old nest; it did not contain any fragments of egg-shell, but on the ground beneath a few pieces of blue shell were discovered. The nest was composed of shreds of bark, feathers, and some grass. On 25th November a schoolboy reported the finding of

a nest situated in the centre of a tussock on the edge of a potato-field. "A brownish-coloured bird flew out of the nest, which contained two blue eggs with blackish spots." The lad was asked to bring me the nest and contents, but when he went for them the eggs had been taken.

I hope soon to be able to forward a specimen of the strange bird for identification. These birds have a peculiar habit of throwing leaves over their shoulders when busily hunting for food.

Notes on the Cassowary (*Casuaris australis*, Wall).

BY H. L. WHITE, R.A.O.U., SCONE, N.S.W.

FOR years, prior to 1911, I offered as much as £10 each for full clutches of Cassowary eggs, had upwards of a dozen men on the look-out for me, and obtained one clutch only. The reports were usually, "Birds often seen, but eggs impossible to find." The aborigines even appeared able to secure only odd eggs.

Since 1911 I have obtained five clutches and several odd eggs, all of which show variations in size and colour. Following are the measurements of average-sized specimens from my six sets:— (1) 5.03×3.57 ; (2) 5.15×3.68 ; (3) 4.87×3.67 ; (4) 5.27×3.67 ; (5) 5.58×3.78 ; (6) 5.52×3.92 . No. 6 is the largest egg of any Australian species in my collection. The colour ranges from pale to very dark green, and is much darker in fresh than in incubated specimens. Cassowary eggs, like those of the Emu, lose their colour completely when exposed to the weather for a length of time. I have an almost white specimen, found in what was supposed to be an old nest. The surface of the shell varies from comparatively smooth to extremely rough and shagreen-like. I have not obtained more than four eggs to the clutch.

Early in May, 1911, I engaged Mr. E. D. Frizelle, who had previously collected for me, to spend a few months in the Rockingham Bay district observing the habits of these most interesting birds. Mr. Frizelle fixed his camp at Clump Point, at the northern end of the bay, and spent five months in the locality, making a close study of the birds during the whole time. He was fortunate in obtaining two clutches of eggs, and confirmed the theory I have always held, that the finding of these rare eggs is almost entirely a matter of chance. Mr. Frizelle is observant, energetic, and a bushman with an extensive knowledge of North Queensland scrubs. He had been well coached, and placed in a locality where the birds were plentiful. If he, therefore, experienced such difficulty (as his notes show) in obtaining eggs, it tends to uphold my argument.

In addition to the difficulty in finding eggs provided with perfect protective colouring, concealed in almost impenetrable scrub, there is the fact that the female bird, when disturbed from her nest, invariably deserts the eggs, and in some instances



Cassowary's Nest in Palm Scrub.

scatters them about. In the case of one clutch in my collection, the eggs, though fresh, are scratched all over, and one of them was found 20 yards away from the nest. The collector, on his first visit, did not approach nearer than 5 yards to the nest, leaving it untouched in order to see whether more eggs would be laid. I consider that this trait on the part of the bird is the cause of a large proportion of the clutches found being incomplete.

The following notes are taken from letters, &c., received from Mr. Frizelle since May, 1911. They are naturally disjointed, but I give practically his own words, and trust that they may throw a little more light upon the habits of this interesting and rapidly disappearing bird.

Mr. J. H. Maiden, Government Botanist of New South Wales, has kindly identified (as well as the material supplied permitted) the various fruit foods of the Cassowary, as hereinafter mentioned. Mr. Frizelle sent me large quantities of fruit, seeds, &c.; but owing to the delay in transit, and the soft nature of many of the specimens, considerable difficulty was experienced in delivering them to Mr. Maiden in a state suitable for identification purposes. The photographs accompanying this article were taken under great difficulties. The pictures of the Cassowaries' nests *in situ* are, I understand, unique.

FIELD NOTES.

CLUMP POINT, N.Q., May, 1911.—The Cassowaries, in the laying season, appear very jealous of each other, and one female never lays near or within another's district. Like the Tooth-billed Bower-Birds (*Scenopæetes dentirostris*), they have certain patches of scrub which they seem to consider their own. These are of great extent; the smallest I have seen is about half a square mile. I know of another pair of birds which roam in the season over a two-mile block. At certain places the presence of considerable quantities of droppings would lead one to believe that there must be large numbers of these birds present; but they, like horses, have their own sunny spots for resting, from about noon to 4 p.m. This spot can easily be found by searching edges of forest pockets. It was my old native who told me this, and I have proved it. The birds like a dry run, not too stony, and within call of several of the different berries which they eat. I know of about ten different runs now.

The Cassowaries about Cardwell are the first to lay, on account of the dry weather starting earlier there. Young birds are often to be seen with the natives, but they are dangerous pets to have, on account of the way in which they kick. Observed many Cassowaries in the ranges at Clump Point. I never saw such a number of these birds together before. The young birds which I saw must, by the great differences in sizes of various broods, be from eggs laid late or early. We had no difficulty in catching one of three, while others were fully three feet high and able to run like a horse. While with the mother they have a peculiar cry, rather like a note made by a tame young Turkey. We saw also individual young birds walking about alone, but these were shy.

Food this month consisted of the fruit of the bright red berry of a palm (*Archontophoenix alexandrae*, Wendl.), seed of the zamia palm

(*Macrozamia denisonii*, F. v. M.), and the fruit of a tree belonging to the *Sapotaceæ* family.

June.—I selected Clump Point for the camp on account of the number of birds seen and its secluded state. There are birds in any portion of this valley one goes to. In one place, some 3 miles from camp, there are tracks resembling those of cattle, made by Cassowaries in their wanderings along the creek. The only thing against the country is the dense undergrowth, which makes it so hard to travel through. In some places there is an impenetrable mass of lawyer-vines (*Calamus moti*, Bail.) I have been within 10 feet of a Cassowary here. The bird actually sat down, under some lawyer-vines, and watched me also. The birds have not mated yet, and the general opinion is that they will not start until the end of July. But I am out every day, and have selected four pairs, which I visit in turn, spending a day with each. At Maria Creek also I have found the birds, but they are much disturbed by natives, dogs, and timber-getters walking about. Their food for the last two months has been mostly palm (*Archontophoenix alexandræ*, Wendl.) berries—a small red berry three times the size of a pea. These are knocked down in thousands by the purple-breasted Fruit-Pigeon (*Megaloprepia assimilis*, Gld.), Topknot-Pigeon (*Lopholæmus antarcticus*, Shaw), and White-headed Fruit-Pigeon (*Columba leucomela*, Temm.), which are here in large numbers. If it were not for these berries the Cassowaries would often go hungry. Of course, there are a few other kinds of berries which they obtain in the same way, but these are by no means so plentiful as the palm berries.

The young Cassowaries seen with their parents are too big to be this year's birds. Now the young have mostly been hunted by the female, who, however, makes little heaps of berries as she goes about, as if for their benefit. The young birds can easily look after themselves, as they can beat a dog, to my own knowledge. Though one may meet an odd Cassowary walking about among the scattered palms on a creek-bank, or flush one from the kangaroo-grass in a quiet pocket, to see the mob one has to go to a palm scrub among the foot-hills. In such a spot may be seen as many as six Cassowaries close together; the males can easily be recognized by their size alone. I came across a nest containing three eggs on Thursday, 15th June. As there were no more by Saturday evening, I took the clutch, and found that the eggs were all slightly incubated. They are light green in colour, and were laid two feet from the base of a large clump of lawyer-vines (*Calamus moti*, Bail.), in the sunlight. I was beside them before I saw them, the scrub was so dense. Last year a farmer took up land here in July, and in brushing his scrub in August he found a nest with four eggs; and Mr. Cutten, of Clump Point, has a set of three, obtained in August.

By comparing the notes, which I took from Gould's "Handbook" and from other sources, I am sure that the birds lay up to mid-September (Patterson's Atherton set). And, although it is pure luck finding them now, I think that the season has only just started. (Rainy season just finished.) My system is, first to see a pair, then find the usual feeding ground and watering place, and search the country round about. There are seven small creeks altogether in the country which I have selected for hunting; these creeks rise from the Clump Mountain Range, to the south, and travel north-east to north. Four are permanent. During my first trips to find out



Cassowary's Nest Among "Lawyer" Canes.

the lay of the country I often heard and saw Cassowaries, but always the birds were solitary, and during my whole trip so far (August), I have seen a pair together only six times. I know now that the male bird never visits the nesting country, but keeps within warning call of it. When anyone approaches he utters his deep-sounding "Bōōm bōōm"; or else, if taken by surprise, a short "Heūgh heūgh heūgh." He may also stamp his feet on the ground as he goes away. The feeding hours were easy to find out. Cassowaries are early risers, and at daybreak are to be seen, in this month, feeding on the red palm berries or else the large red plum. The female returns to the nest before 8 o'clock if she is laying; but the male bird travels about his feeding-ground till about 11 a.m., when he selects a sunny—or, if raining, a sheltered—spot, and rests until about 2 p.m., when he resumes his feeding. At about 5 p.m. he returns to higher ground, and walks about for a while before going to his favourite camp for the night. These camps are usually under a mass of lawyer-vines, and, in many instances, those I found were rain-proof to a great extent. The female, when laying, does not leave the nest until 11 a.m. or later. She feeds until 1 p.m. If the weather is fine she is away from 5 p.m. till 5.30 p.m., when she returns to her nest for the night.

Food this month consisted of the bright red berries of a palm (*Archontophoenix alexandrae*, Wendl.), a long-stoned plum (*Cryptocarya*, sp.), a yellow fruit (*Polyalthia*, sp.), scrub-apple (? *Pygeum turnerianum*, Bailey), seed of the zamia palm (*Macrozamia denisonii*, F. v. M.), &c.

July.—It has been raining continually here since the middle of June, and the Cassowaries have just started laying. I consider that July and August are the two principal months for egg-laying, and that June is the beginning and September the end of the laying season. I have been cutting my way through a portion of the scrub where I saw birds, but so far without result. As I do not like to stir them up continually in the one place, I keep changing my country. The scrub here is like a wall, and the natives never go through it, but follow the beds of the creeks. The male Cassowary is in brilliant colours now. On seeing or hearing anyone near he makes a deep "Bōōm bōōm," and strikes the ground a few times hard with his feet. One thing I notice is that, in spite of the bird being clumsy and heavy, he is hard to track, and can go through the thickest lawyer patch with head held about a foot off the ground, like a fast-trotting horse. We searched the country marked on the rough map so persistently that the birds left it. Since the end of June (now 18th July) we have noticed that the birds do not make the "Bōōm bōōm" so much. Often they camp for the night in a thick clump of scrub pandanus, and, as the least movement can be heard, I have no doubt it is for purposes of protection.

We saw a male bird showing off before his mate yesterday (17th July), and it was the most amusing performance I ever saw in the bush. The male pretended to be very frightened, and darted away for 50 yards, tearing aside everything in front of him. Then he turned and came back with a rush as if he were chasing something, which he pretended to kill by a terrific jump and a few thuds of his feet. Then he made a noise which I cannot describe, and walked away up *my track*. I noticed during the first part of this month that the majority of the birds had become quiet. One which I passed

every morning when he was eating his breakfast always greeted me with a "Bööm" or two, and now he is silent. The Cassowaries by the middle of this month had become energetic, and were to be seen almost anywhere. But I strongly suspect that they follow me. Their feeding grounds are far larger than I thought, June being so wet that the birds made a sort of a pad going for food. When one gets used to it he can follow them everywhere. I followed one bird about all day, and he was fully a mile away from his camping-ground at one time. They have regular, well-marked tracks going over foodless ridges or crossing creeks and dry gullies to favourite feeding-grounds.

Food this month consisted of the bright red berries of a palm (*Archontophoenix alexandræ*, Wendl.), blue quondong (*Elæocarpus grandis*, F. v. M.), red plum (species of *Eugenia*), a long-stoned plum (*Cryptocarya*, sp.), a yellow fruit (*Polyalthia*, sp.), scrub apple (? *Pygeum turnerianum*, Bailey), seed of zamia palm (*Macrozamia denisonii*, F. v. M.), &c.

August.—If I had not heard, on good authority, of the finding of one Cassowary's egg on Sunday (30th July), I would have thought that the birds had finished laying. Last month I kept two pairs of birds under observation as well as I was able. The females were to be seen feeding by themselves at 8 a.m., 10.30 a.m., and 4 p.m. Though the males were not far off, I never saw them with their mates, but observed tracks of the two on a sand-bank. No young birds have been seen yet. The natives capture some every year here with their dogs. The more I study the food question of the Cassowary the more convinced I become that the bird swallows anything except what is actually nauseous, and there are a few fruits of that order here. I am in good country now, only rather far from camp; so I am going to camp out in the scrub, to be near the birds for a while. On 2nd August, after three weeks' search, I found clutch No. 2, containing four eggs. Will leave it till 6th August before looking again. I looked all round the spot a week before, and never saw the nest. I waited until the evening of 5th August, and then took the four eggs from the ground. There were stains underneath them, and when I blew them I found that they were slightly incubated. I have had the clutch of three eggs (No. 1) photographed in the natural position. (See Plate XXI.)

This is a very important month for the Cassowaries, as the quondongs, which form their chief article of food, finish. In the first half of this month there were great quantities of Cassowary food on the ground, but the weather kept dry, which caused an earlier ripening of the fruits. This affected the birds, and at the end of the month the males rarely left the vicinity of a good food tree, if on their run. They seemed to be watching over the tree, so that their mates should have plenty to eat. They were also more wary than usual, seldom uttering a sound unless surprised. This alteration in their habits was a great disadvantage to me, as it was by noting the different intonations of the sounds made that I could tell when I was in the vicinity of their nests. The male follows one about, and from time to time utters a low "Bööm," or, if one is near the nest, a quick "Heûgh heûgh heûgh." Sometimes he tries to lead one away by "booming" in a new quarter. If successful he suddenly stops and goes back to his sentry-ground again.

The Cassowary utters no other sounds save the mate call and the



Cassowary Pad in Palm Valley.

danger notes. If one comes quietly on a bird while it is having its mid-day rest there is a mad, tearing rush, the Cassowary often being brought up by the lawyer-vines rather suddenly. But it never seems to look where it is going. From early morning till dusk there is a Babel of song and rustling of leaves in the scrub, with brief intervals of quiet, broken only by the "Buk-buk-boo" of the beautiful purple-breasted Fruit-Pigeon (*Megaloprepia assimilis*, Gld.), or the harsh notes of the Rifle-Bird (*Ptilorhis victoriæ*, Gld.) and Quoy's Butcher-Bird (*Cracticus rufescens*, De Vis). The first appearance of the white Nutmeg-Pigeons (*Myristicivora spilorrhoa*, Gray) was on the 10th of this month. A Hull River native caught a young Cassowary this month, but liberated it at my request. It was three weeks or a month old. It did not seem to be afraid of human beings, but became frantic at sight of a dog. The White-headed Fruit-Pigeons (*Columba leucomela*, Temm.) visit this locality in large numbers while the quondongs are in, and on the arrival of the Nutmeg-Pigeons, about the 10th August, they had all disappeared.

Food this month consisted of the blue quondong (*Elæocarpus grandis*, F. v. M.), red plum (species of *Eugenia*, a long-stoned plum (*Cryptocarya*, sp.), a yellow fruit (*Polyalthia*, sp.), scrub-apple (? *Pygeum turnerianum*, Bailey), seed of the zamia palm (*Macrozamia denisonii*, F. v. M.), &c.

September.—In spite of all my efforts, I found no more nests, but saw two broods of young birds, consisting of three in each case. It is my opinion that the majority have hatched out. I saw three Jabirus (*Xenorhynchus astaticus*, Lath.) on a swamp near the Hull River, not far from the sea. Here there are a few Rifle-Birds (*Ptilorhis victoriæ*, Gld.) and Spotted Cat-Birds (*Elurædus maculosus*, Ramsay), but Tooth-billed Bower-Birds (*Scenopæetes dentirostris*, Ramsay) are scarce. The handsome *Pitta strepitans* is abundant everywhere, also the Bower Thrush (*Pinarolestes boweri*, Ramsay). Have seen only one Manucode (*Phonygama gouldi*, Gray) all the time, but often hear them. They are shy birds. The search was on a portion of a creek with a hill rising from one bank with flat terraces, dense growth of lawyer-vines, and steep, dry gullies to the east. On the western side there is a continual thicket of lawyer-vines and heavy scrub. One Sunday (10th September) I came across a female Cassowary with three very young birds. This left me only the pair from which I obtained the set of four eggs. In spite of my careful search for the nest, the female hatched out four eggs on or about 26th September. She crossed the creek with the brood one day while I was having my lunch. I seldom heard the birds make a sound; when I did it was generally a female with young, who had got wind of me. The male birds went over the range for food, with the exception of one or two, which returned to their old haunts of May and June. There being no quondongs, and a scarcity of other kinds of foods, the birds have a hard time of it this month. The young birds are easily caught by a quick rush, as they simply run into a thick clump of lawyer-vines and hide. When one comes on a bird with young she tries to "bluff" by a "Bōōm" or two, and a pretence of charging, thus gaining time for her chicks to hide. Then, with a quick run, she too disappears. But if one waits for a while and keeps quiet she returns and gathers the young ones together, uttering a low "Heūgh," repeated many times. There are signs that, as the young birds grow strong, they migrate westward to the lower slopes of the main range, where food will still be available.

Food this month consisted of the blue quondong (*Elæocarpus grandis*, F. v. M.), scrub-apple (? *Pygeum turnerianum*, Bailey), and have seen these birds eating the black cherry (*Endiandra*, sp.), wild banana (*Musa*, sp.), and wild Brazilian cherry (*Acronychia vestita*, F. v. M.)

KAIRI, NEAR ATHERTON, November, 1911.—The largest brood of young Cassowaries I saw here consisted of four birds. They were feeding on the species of fig (*Ficus*) with which Mr. S. W. Jackson and I fed the young of the Tooth-billed Bower-Bird (*Scenopæetes dentirostris*, Ramsay) at "Cherra-chelbo" camp, in the scrub near here, in 1908. The Cassowaries are fond of these figs. The scrub here has been cleared to a large extent.

December.—The food of the Cassowary now is a species of large scrub fig (*Ficus*, sp.), the fruit measuring 1 inch by $\frac{1}{2}$ inch; also the fruit of *Castanospora alphandi*, F. v. M.

January, 1912.—Young Cassowaries are still with the mother. The birds are feeding on a species of fig (*Ficus*) and the fruit of *Castanospora alphandi*, F. v. M. (the leaves of this tree the Tooth-billed Bower-Birds frequently use in their singing or play-grounds, as well as the leaves of other species); the fruit of a species of *Eugenia*, known as the white apple; and the fruit of the black pine (*Podocarpus*, sp.), &c.

February.—Some young Cassowaries are out alone, and their food appears to consist almost entirely of figs of different kinds. The fruit of *Castanospora alphandi*, F. v. M., the fruit of the black pine (*Podocarpus*, sp.), and the white apples of a species of *Eugenia* are also being eaten.

March.—As far as I can see at present, the Cassowaries are having a lean time as regards both species of scrub fruit. On 26th February I observed a splendid male bird feeding on the fruit of the large lawyer-vine (*Calamus moti*, Bailey), and later on found droppings of both mature and young birds, consisting of the stones of the fruit of both the large and small species of lawyer-vine. The lawyer-vines are erratic in fruiting. I never saw them eaten by Cassowaries before, and can only conclude that hunger has made the birds eat them.

CLUMP POINT, 25th June.—The continuous rain, combined with a poor wild-fruit season resulting from last year's very dry spell, has caused a large number of Cassowaries to go elsewhere to look for food and to nest. I saw a female with one young, 2 feet in height, feeding on quondongs, and another, with two young birds, in another spot farther away. Fruit seasons in the scrubs alter with the climatic conditions every year.

Kite as an Egg-Robber.—Last month a fine male specimen of *Lophoictinia isura* (Square-tailed Kite) was brought to me, having been shot while attacking chickens at a neighbouring farm. In its gizzard I found a perfect egg of *Cuculus inornatus* (Pallid Cuckoo). This egg was completely coated with fragments of other broken egg-shells, which apparently were those of *Anthus australis* (Ground-Lark). I cannot find any record in my ornithological works of this Kite feeding on eggs.—TOM CARTER. Broome Hill (W.A.), 12/11/12.



Cassowary Crossing-place on Cedar Creek.

FROM A PHOTO. BY A. GARNER.

Field Ornithology in South Australia.

By (CAPT.) S. A. WHITE, M.B.O.U., R.A.O.U., ADELAIDE.

IN THE MALLEE.

It was not long after my wife and I returned from Port Augusta * that we were on the move again. A camel driver, whom we met north-west of Port Augusta, had told us that when he was carting water with camels for the Brown's Well railway survey he had seen, among the spinifex, birds which answered to the description of the Night-Parrot. We determined to pay that part of the country a visit, and on 8th November, 1911, left Adelaide for Murray Bridge, where we stayed the night. Next day we boarded a steamer. Soon after leaving Murray Bridge we passed large tracts of country which had, until recently, been covered with swamps, but were now divided into cultivation paddocks. Later on we saw a large swamp, which had been banked round. Engines were at work pumping out the water. Many water-birds were seen here. We thought, Where are these birds to go when all the swamps have been reclaimed? If they come near the river-banks they are shot at by so-called sportsmen on the steamers. At 6.30 o'clock that evening the steamer reached Bow Hill, and we landed with our tent, provisions, &c. We were met by a young farmer, a resident of the district, who was to take us "out-back." We camped at Bow Hill for the night, and next morning loaded up and made an early start. It was not long before we found ourselves following a loose sandy track, through thick mallee.

The first bird to attract attention was the Crested Bell-Bird (*Oreoica cristata*), whose notes sounded clearly on the morning air. Hearing a bird-note which was unfamiliar, we investigated, and found a small family of the Southern Striated Grass-Wrens (*Diaphorillas howei*, Mathews). They were extremely shy, passing from bush to bush with great rapidity. But curiosity often overcomes their timidity. When I gave the call of a wounded bird, one came out of hiding and perched upon the topmost twig of a bush. It uttered a pleasing song. We hunted for a nest, but failed to find any trace of it. As the day advanced the heat became intense. A deep sandy track led us over a succession of ridges densely clothed with mallee. The heat was so great that few birds were seen or heard. We were glad when we came to the end of the last mile of the thirty which lay between our starting-point and Ned's Well. We drew water for our horses from a depth of 170 feet. Soon the tent was pitched. We heard the call of the Boobook Owl (*Ninox boobook*). Next morning we beat the spinifex, which extended for miles around the camp, but not a sign of *Geopsittacus occidentalis* did we find. White-

* See *The Emu*, vol. xii., part 2, pp. 122-130.

eaed Honey-eaters (*Ptilotis leucotis*)* were seen in the mallee, and their frog-like call was heard in the early morning. But when the heat of the day set in they became silent. The Wattle-cheeked Honey-eaters (*Ptilotis cratitia*) were also fairly numerous, and we observed numbers of immature birds. The Chestnut-backed Ground-Birds (*Cinclosoma castanonotum*) and the Brown-headed Honey-eater (*Melithreptus brevirostris*)† were also seen. Our attention was arrested by a peculiar call, the first notes of which were certainly typical of the *Pachycephala*, but they were followed by a peculiar sound like that produced by the rapid drawing-in of the breath through partially-closed lips. It was not long before we found that the call came from two male Thickheads which were in conflict. Both birds were secured; they appeared to be specimens of *P. gilberti*, but after our return I found that they differed. Directly I read John Gould's description of *P. rufogularis* I knew that my specimens were of that species. Later, we secured a female. (See *Emu*, vol. xi., p. 212.)

After dinner we struck camp, and, in spite of the heat, drove 25 miles through the thick mallee along a sandy track to Turner's Well. We lowered the bucket about 150 feet, and drew up some water, which was tipped into an old iron trough for the horses to drink. Within 10 minutes the trough was full of birds, fighting with one another for the water. Among them were some Miners which we thought appeared strange. (On our return we found that specimens answered to the description of Mr. F. E. Wilson's *Myzantha melanotis*, found in the Mallee, North-West Victoria.) Other birds which came for a drink were Crows (*Corvus coronoides*), White-plumed Honey-eaters (*Ptilotis whitei*, Mathews' "Reference-List," p. 412), and the Spiny-cheeked Honey-eater (*Acanthogenys cygnus*, Mathews' "Reference-List," p. 420). The weaker birds, which were beaten off by the stronger ones, lay on the ground with outstretched wings, overcome by the heat. Next day we travelled towards the river. Passing through the big mallee we saw *Cinclosoma castanonotum* in pairs running about with great rapidity. When flushed these birds flew only a short distance before alighting on the ground again. We did not hear them utter any call. We met with many birds in the mallee. The Shell-Parrots (*Melopsittacus undulatus*) were seen in numbers. The Many-coloured Parrot (*Psephoix multi-color*) and the Crested Bell-Birds (*Oreoica cristata*) were plentiful. The Yellow-plumed Honey-eaters (*Ptilotis ornata*) were fairly numerous in the big mallee. We reached the river at 6 p.m., about which time the steamer was expected to pass. A cool change set in, and a strong wind blew up from the south-west. We sat on the river-bank till 1 a.m. next day, when the steamer put in an appearance. So ended our trip to the mallee end of the Murray. We were well rewarded in the re-discovery of Gould's *Pachycephala rufogularis*.

* ? *P. novæ-noriæ*.—EDS.

† ? *M. leucogenys*.—EDS.

ON THE LAKES.

Soon after our return to Adelaide we made arrangements with Mr. Fred. Ayres, J.P., of Narrung, to hire his motor boat, and also engaged the owner's services. Leaving Adelaide by the early morning train to Milang, we reached the township, situated on the shore of the lake, by noon of the same day, 21st February, 1912. The list of stores was completed, and we left by steamer soon afterwards for Narrung. On arrival we transferred our baggage to the motor boat, which then steamed down the channel which connects Lakes Albert and Alexandrina. Near a small island (covered with reeds) we dropped anchor. Between our



Bird-observing in Duck-Boat.

FROM A PHOTO. BY S. A. WHITE.

little boat and the shore lay a vast mud-bank, on which grew a tangled mass of aquatic plants covered by a few inches of water. This spot was the feeding-ground for thousands of water-birds of many species. The flags and reeds which surrounded the bank were found to be the home of many more species. Towards evening we put a small duck-boat over the side, and spent an hour or two paddling about. We were able to approach close to the birds by lying flat down in the boat with eyes level with the gunwale. After tea that night we sat on deck till a late hour. Many hundreds of birds had been seen before the light of a hot summer's day faded, but flocks continued to arrive as we sat there, till a perfect Babel of bird-calls sounded around us.

Next morning we were early astir. Many species of birds which had fed around us on the previous night were taking their departure for a more secluded spot. After breakfast we started our work in earnest. Making for the flats, we pushed our way among the aquatic plants and soft mud. Skirting a thicket of tall reeds, the first bird to attract our attention was the Spotless Crake (*Porzana plumbea*). These little birds were in unusual numbers, feeding close to the reeds. There were many immature birds among them, proving that they had nested in this locality in numbers during the last season. Mr. Ayres informed me that he had not seen this bird before on the lakes. (He wrote a few weeks after our return stating that all these birds had disappeared from the district.) Their food seemed to consist of particles of aquatic plants and water insects. In company with the Spotless Crakes were Spotted Crakes (*Porzana fluminea*), but they were not so numerous. Their habits and food seemed to be the same. The Bald-Coot (*Porphyrio melanotus*) was in great numbers, strutting about among the weedy shallows. Black Moor-Hens (*Gallinula tenebrosa*) were present in small flocks of from five to a dozen, in deep water, close to the reeds, into which they darted at the slightest sound. (These birds, apparently, do not develop the bright colouration on the legs before the second or third year.) We met with the common Coot (*Fulica australis*) in great numbers. They were swimming about and feeding with Ducks. A few White Egrets (*Egretta syrmatophora*) were seen feeding on the mud-banks. The White-fronted Heron (*Notophoxyx novæ-hollandiæ*) was not plentiful, and few Bitterns (*Botaurus pæciloptilus*) were seen. The Sharp-tailed Stint (*Heteropygia aurita (acuminata)*) had congregated in immense flocks. When startled by a Hawk the birds rose in one dense cloud, which darkened the sky. Only one Banded Stilt (*Cladorhynchus leucocephalus*) was observed; but the White-headed Stilts (*Himantopus leucocephalus*) were in numbers, many being immature birds. They kept up their barking call day and night. Reed-Warblers (*Acrocephalus australis*) were plentiful, and their notes floated over the water from the dense mass of reeds and flags the livelong day, and often at night. Many Grass-Birds (*Megalurus gramineus*) were seen.

The glass began to fall rapidly, and our skipper deemed it advisable to shift our berth. The boat moved a short distance up the channel, and entered a narrow bay, between an arm of the mainland and a small island, covered with dense reeds from 10 to 12 feet high. Dropping anchor here, we continued our bird observations in comfort. We saw a few Pelicans (*Pelecanus conspicillatus*) sunning themselves on the edge of a mud-bank. Red-capped Dottrels (*Ægialitis ruficapilla*) were present in numbers, feeding with Tringas on the mud-bank. A few Pied Cormorants (*Phalacrocorax hypoleucus*) were seen, also the Little Black (*P. sulcirostris*). After working the channel on both sides we travelled to the mouth, where it opens out into Lake Albert.

We took up our moorings under a reedy bank and went ashore to stretch our legs, as we had been several days in a small boat. We visited an aborigines' burial ground, and noted a few birds, including the Black Cormorant (*P. carbo*). These birds were extremely shy, no doubt owing to the fact that they are shot at by persons on boats and steamers. While ashore we saw the Blue Wren (*Malurus cyaneus*). Up to this time we had seen few Ducks. In the channel one or two Mountain Ducks (*Tadorna tadornoides*) were observed. Black Ducks (*Anas superciliosa*) were not at all plentiful. The Grey Teal (*Nettion gibberifrons*) was more abundant, and there was a fair number of Australian Shovellers (*Spatula rhynchotis*) and White-eyed Ducks (*Nyroca australis*). A good many Musk Ducks (*Biziura lobata*) were seen floating along the edge of the reed-beds, the majority being immature.

A stiff breeze blew at night from the south-west, and brought a nasty choppy sea out of the lake into the mouth of the channel. Our little craft, which was light in the water, pitched a good deal. Towards morning the wind slackened and the sea went down. A fine flock of Pelicans was seen coming up the channel. The birds were in line, and as they glided along, with the sun shining on their plumage, they resembled a squadron of boats with all sail set. After leaving the channel we threaded our way through innumerable mud-banks and sand-bars. It was here that we first came in touch with the Tippet Grebe (*Podiceps cristatus*). The birds were wary, and dived cleverly. As we crossed the north-west corner of Lake Albert, Tippet Grebes, Hoary-headed Grebes (*P. poliocephalus*), Pied Cormorants, and Black Swans (*Chenopsis atrata*) scuttled out of our way. Reaching our anchorage under Rumply Point, we did little that evening except watch the thousands of waterfowl flying off to their feeding-grounds for the night. Next morning, after breakfast, we boarded the duck-boat and paddled and poled into a deep inlet. On a long, sandy spit, within a short distance of our boat, was a vast flock of Shieldrakes (*Tadorna tadornoides*), from 3,000 to 4,000 birds. We drifted closer and closer, until, at last, a sentinel gave the alarm, and in a moment the birds were on the wing. Proceeding up the inlet, we sighted some Yellow-legged Spoonbills (*Platalea flavipes*) in the company of a few Royal or Black-billed Spoonbills (*P. regia*). Through the field-glass we could plainly see the Spoonbills walking in line, with the water nearly up to their knees. As they moved along they swept their bills through the water, from side to side, in search of food. The birds were shy. Numbers of White Ibis (*Ibis molucca*) were seen, and Ducks were plentiful. One spot was frequented by thousands of White-eyed Ducks. These birds were diving in deep water for their food. The stomachs of specimens shot contained great quantities of small fresh-water molluscs. A Narrow-billed Bronze-Cuckoo (*Chalcococcyx basalis*) was taken from the high reeds on the edge of the water; it was being fed by a Reed-Warbler, which, no

doubt, was its foster-parent. We spent a few days here exploring the shore of the lake. It was a good anchorage while the wind kept from the south-west, but it began to shift round, and we made for the port of Meningie, on the far side of the lake. We ran into half a gale of wind with a beam sea, which made things uncomfortable. After we arrived at the Meningie jetty the boat continued to pitch so much that I decided to land and spend the night at the hotel. When passing through the township we sighted a Crow with a white breast, and gave chase, but did not secure it. (The bird was afterwards sent to me by a lad at Meningie, and proved to be a freak, partial albinism.)

Next day we hired a trap and pair of horses, and worked back into the scrub to the east of Meningie in search of the Bristle-Bird (*Sphenura broadbenti*).^{*} The country traversed was undulating, and the soil a light sandy loam, covered with low scrub (*Banksia*)—ideal conditions for *Hylacola*. We found the Rufous-rumped Ground-Wren (*H. pyrrhopygia*) in numbers. On entering more open country, where there were stony ridges covered with heath-like vegetation, we came upon a small party of *Calamanthus*, which resembled *Calamanthus ethelæ* (Mathews' "Reference-List to Birds of Australia," p. 337). Amongst the low bushes on a sandy rise a small flock of *Acanthizas* was observed, and specimens were secured.[†] The Redthroat (*Pyrrholæmus brunnea*) was seen in many places. When passing through tea-tree scrub on a salt flat some Scrub-Wrens (*Sericornis maculata*) were observed. The Whiteface (*Aphelocephala leucopsis*) was seen in great numbers. We saw also a number of Grass-Parrots (*Psephotus elegans*) feeding over the burnt ground.

Returning to Meningie that night, we went on board the launch early next morning and steamed along the coast to the west. We reached Dodd's Creek at mid-day. A party of natives was camped there, and the birds were much disturbed. We made over to Rumpley Bay, but found that the water was too shallow to allow the boat to come close inshore, so we proceeded round the point and dropped anchor close to the place which we had left a few days previously. We spent a few more days among the water-birds. Several Black Swans (*Chenopsis atrata*), with large young ones almost ready to fly, were seen. Just before leaving, a small party of Turnstones (*Arenaria interpres*) put in an appearance. Leaving Rumpley Point we made for the Albert Channel, passing in as darkness came. We spoke the mail steamer, which was stuck fast on a mud-bank at the mouth. Proceeding along the channel we picked up our first berth, beside the reeds. It was a glorious moonlit night, and when the anchor chain rattled out the birds flew in thousands from their feeding-ground. Next day, after some bird-observing, we packed up. When the mail

^{*} Mr. Gregory Mathews has since named it *S. broadbenti whilei*—vide *Austral Avian Record*, vol. i., No. 3, p. 79.—S.A.W.

[†] Mr. Mathews has described this bird as *A. iredalei hedleyi*—see *Austral Avian Record*, vol. i., No. 3, p. 78.—S.A.W.

steamer came up the channel on her way to Milang the launch followed her. In the Narrows we ran alongside and transhipped our belongings, saying good-bye to the little launch and her owner.

Birds of Port Germein, South Australia.

BY J. W. MELLOR, R.A.O.U., ADELAIDE.

A TRIP to the little town of Port Germein, on the eastern shores of Spencer Gulf, South Australia, will repay an ornithologist. There are many different kinds of country within the vicinity. The water of the gulf recedes about a mile at low tide, leaving a wide expanse of dry sand and shallow pools for the Waders. About 6 miles inland the lofty Flinders Range runs parallel with the gulf, giving steep hillsides and deep ravines in which Honey-eaters and Parrots delight. Between the mountains and the sea there are patches of mallee, sheoak, and tea-tree country, also salt-bush and blue-bush flats. Along the gulf are salt samphire flats and mangrove swamps, which are flooded in rough weather, when high tides cover the low lands.

My last visit to the district was made in August, 1912. After taking part in a rifle competition in connection with the Port Pirie Military Rifle Club, I caught the Port Germein mail coach on 22nd August. We reached our destination at about 8 o'clock that night. A walk on the noted Port Germein jetty prepared me for sleep. The pier is between 1 and 2 miles in length. It spans the shallows previously mentioned, and ends in comparatively deep water. Next morning an early start was made. With a pack on my back I set out for a day's tramp along the flat country between the gulf and the ranges, where salt-bush and blue-bush were plentiful. It was not long before the White-winged Wren (*Malurus leucopterus*) was observed in the salt-bushes. The males were shy, and would not allow one to approach closely. After tramping many miles towards the rising grounds, where there were mallee, tea-tree, and other vegetation, the salt-bush forming good undergrowth, I halted for lunch.

My quest after birds had not been as successful as I had anticipated up to the present, for, although I had identified a few species, the bird of my desire, the Darker Turquoise Wren (*Malurus whitei*), had not appeared. This species was named comparatively recently by Mr. A. J. Campbell, after the late Mr. Samuel White, of the Reedbeds, South Australia. Practically nothing has been recorded regarding the habits of this beautiful little Wren, and its habitat, I believe, has not been defined. I do not consider it to be a bird of the interior at all, as stated by Mr. Campbell, but of local habitat, near Spencer Gulf. While I was eating the mid-day meal a flash of light, as it were, passed before me into some bushes not far away. This "light" was the object of my search. I waited breathlessly for another glimpse of the

little gem, but it had gone. I was almost in despair when the bird, a beautifully-plumaged male, shot past me again, and was out of sight as quickly as before. But it soon reappeared, and I was able to get fleeting glances at it from time to time, also of a female. These birds appeared to be shyer than other members of the Wren family. They kept to the thick salt-bushes and other undergrowth, ever and anon shooting out and darting into some thick-topped tea-tree, and out again the other side. The males seldom stopped in the open to allow of close observations being made. Both the male and female uttered pretty little trilling calls, somewhat resembling the notes of the Purple-backed Wren (*Malurus assimilis*), in whose company I found them. The notes had a peculiar silvery tone, and were uttered in a succession of rounded trills, quick time. These notes were made while the bird was perched, and not while on the wing. Later in the afternoon a second male was noted; it was in partial nuptial plumage, and was accompanied by a female of the usual brown colour. The Redthroat (*Pyrholaemus brunnea*) was most active and inquisitive at this spot, both the males and females coming close up to me. In a tall mallee bush two Chestnut-tailed Tits (*Acanthiza uropygialis*) were lining their compact little nest of fibre and bits of grass. Ever and anon both birds would arrive with beaks full of material, one popping into the nest while the other waited outside on a convenient twig. The bird outside would enter the nest when its mate emerged, and then both would fly away together to gather more material. The Wood-Swallows (*Artamus tenebrosus*) were active, keeping to certain trees in pairs, and flying at any other birds which happened to come their way. These actions indicated that they contemplated nesting soon. A search for nests was unsuccessful. The melodious notes of the Grey Shrike-Thrush (*Collyriocincla harmonica*) came at intervals from the thickets close by. Silver-eyes (*Zosterops cœrulescens*) were also present, and, in another direction, the "Clink-clink-clink" of the Brown Tree-creeper (*Climacteris scandens*) reminded one of more open woodlands. The Whiteface (*Aphelocephala leucopsis*) was plentiful in many places, and a small covey of Black-capped Tree-runners (*Necositta pileata*) came along, flying after one another, and uttering their loud call-notes. Ever and anon they settled on some suitable tree, and climbed round and round it in search of insect food. A Brown-headed Honey-eater (*Melithreptus brevirostris*)* came flying past with a beakful of hair or shredded bark, and disappeared in the thick foliage of a gum-tree, where the small cup-shaped nest was being built.

As it was late, and there was a long way to go, I began the return journey to Port Germein by way of a winding, stony creek, with large red gums (*Eucalyptus rostrata*) growing all along its course. A pair of Ring-necked Parrots (*Barnardius barnardi*) went flying away, with harsh cries, as I reached the creek, having

* ? *M. leucogenys*.—Eds.

been disturbed from their roosting-place, and, probably, their future breeding haunt. Further on, a White-fronted Heron (*Notophoxyx novæ-hollandiæ*) flew, croaking, away from a still pool where frogs were abundant. The "Knee-deep, knee-deep, knee-deep" notes of the Magpie-Lark (*Grallina picata*) were heard as the bird walked about in the water up to its knees in search of small aquatic insects for its young. The nest was on a horizontal bough of a large gum-tree overhanging the water. Across a field of growing corn, a short distance away, a Spotted Harrier (*Circus assimilis*) came soaring. When I reached Port Germein darkness had fallen.

The following morning a drizzling rain fell hour after hour. As my time was limited, I could not afford to sit down and do nothing all day, so I set out to walk along the coast. The wind was blowing "big guns," but the shore-birds and Waders seemed not to heed it; they roamed over the broad, open flats laid bare by the receding tide, pecking at the small crustaceans as they came from their hiding-places. At the mouth of a salt-water inlet, or "river," a number of species was congregated in a quiet corner, well sheltered by tall mangroves. I noted a flock of Curlews (*Numenius cyanopus*), which might have been thousands of miles away, breeding on the tundras of Eastern Russia and Siberia. But there they were, with their long, curved bills, reminding one of Brown Ibises as they kept probing the soft mud and sand. The Little Stints (*Pisobia ruficollis*), in winter plumage, were running over the wet sand. On the shore, above high-water mark, were two Pied Oyster-catchers (*Hæmatopus longirostris*), whose actions indicated that they had eggs or were about to nest in the locality. A search did not reveal any nest. There were numbers of the Red-capped Dottrels (*Ægialitis ruficapilla*) on the sandy flats, and one was disturbed on the higher parts. It went limping away, but the nest was not to be found, although undoubtedly not far off. A Black-tailed Godwit (*Limosa novæ-zealandiæ*) was frightened from a shallow pool left by the tide. Towards evening I started on the return to Port Germein, arriving after 8 o'clock.

Next day a jaunt to the Flinders Ranges was the programme, and an early start was necessary if the 6 miles of intervening country were to be covered in time for work to be done in the hills. Breakfast was dispensed with, and, with an empty pouch and a light heart, I accomplished the journey. Along the track the Song-Lark (*Cinclorhamphus cruralis*) kept soaring up, uttering his "Cock-tick-a-wee-loo" notes many times, and then descending to alight on a convenient post. The Lesser Bush-Lark (*Mirafra secunda*) was also present, but was not singing in its well-known "Skylark" manner. A little flock of Chestnut-eared Finches (*Taniopygia castanotis*) flew up from the ground, where they were feeding, and alighted on a small bush by the roadside, uttering their little "Chink-chink-chink" notes. At the mouth of the Port Germein Gorge, the point to which I was bound, a halt was made for breakfast, which consisted of an

egg boiled in an old jam tin and a biscuit or two. The spot was an ideal one for the naturalist. The ravines were deep and rugged, with crag upon crag jutting from the heights above—good resting-places for the Wedge-tailed Eagles (*Uroaetus aulax*), which were seen soaring aloft at a great height. In the gorge itself, which wound about and gradually ascended across the ranges, a stream of water made its way in snake fashion, crossing the roadway no fewer than 47 times in the space of two miles. Large gum-trees grew in the bed of the creek.

I was kept busy from the time when I entered this fascinating spot until I emerged, late in the afternoon. A Red-backed Parrakeet (*Psephotus haematonotus*) was the first bird of note to attract my attention, as it flew up from the grass and settled in a small tree close by. An Elegant Grass-Parrakeet (*Neophema elegans*) came flying over and rested for a few minutes in a giant eucalypt growing in the creek. Not far away two Many-coloured Parrakeets (*Psephotus multicolor*) were feeding quietly in the short grass. High up in the shelter of some rocks on the face of the precipice were clusters of nests of the Fairy Martin (*Petrochelidon ariel*). The birds were flying round, but on climbing up the face of the cliff to the nests I found that the birds had not yet laid. The Tree Martin (*Petrochelidon nigricans*) was noted further along, dodging in and out of hollow spouts of an old gum-tree. Honey-eaters were present in numbers. The White-plumed (*Ptilotis penicillata*) and the Yellow-plumed (*P. plumula*) were seen. One of the latter species was shot, and, as it lay on the ground, another bird flew down and started to peck its head. So absorbed was the live bird that several times I nearly touched it with my fingers. The dead bird was left for a while, and five more Honey-eaters came down and began pecking their dead mate in a savage manner, dragging it several inches away. The Yellow-throated Miner (*Myzantha flavigula*) was observed in the eucalypts, and some Black-throated Honey-eaters (*Melithreptus gularis*) uttered their usual sing-song notes as they searched the boughs for insects. A few specimens of the Spiny-cheeked Honey-eater (*Acanthogenys ruficularis*) were heard singing in the thick brush, and a glimpse of them was obtained. A Red-capped Robin (*Petræa goodenovii*) flew up and perched on a twig close to me. The Great Brown Kingfisher (*Dacelo gigas*) was present. I returned to Port Germein by a roundabout route.

In the three days I had observed no fewer than 73 species, and the weather was against me for a part of the time. The following is a complete list of the birds noted:—

- Silver Gull (*Larus novæ-hollandiæ*).
- Little Black Cormorant (*Phalacrocorax sulcirostris*).
- Black-tailed Godwit (*Limosa novæ-zealandiæ*).
- Black Oyster-catcher (*Hæmatopus fuliginosus*).
- Pied Oyster-catcher (*Hæmatopus longirostris*).
- Black-breasted Plover (*Zonifer tricolor*).
- Stone-Plover (*Burhinus grallarius*).

Curlew (*Numenius cyanopus*).
Little Stint (*Pisobia ruficollis*).
Red-capped Dottrel (*Ægialitis ruficapilla*).
White-fronted Heron (*Notophoxyx novæ-hollandiæ*).
Mallee Parrakeet (*Barnardius barnardi*).
Many-coloured Parrakeet (*Psephotus multicolor*).
Red-backed Parrakeet (*Psephotus hæmatonotus*).
Elegant Grass-Parrakeet (*Neophema elegans*).
Purple-crowned Parrakeet (*Glossopsittacus porphyrocephalus*).
Wedge-tailed Eagle (*Uroæthus audax*).
Whistling Eagle (*Haliastur sphenurus*).
Spotted Harrier (*Circus assimilis*).
Brown Hawk (*Hieracidea berigora*).
Raven (*Corone australis*).
Kestrel (*Cerchneis cenchroides*).
White-backed Magpie (*Gymnorhina leuconota*).
Butcher-Bird (*Cracticus destructor*).
Magpie-Lark (*Grallina picata*).
Strepera, sp. (?)
Peaceful Dove (*Geopelia placida*).
Great Brown Kingfisher (*Dacelo gigas*).
Sacred Kingfisher (*Halcyon sanctus*).
Wattle-Bird (*Anthochæra carunculata*).
Yellow-throated Miner (*Myzantha flavigula*).
Spiny-cheeked Honey-eater (*Acanthogenys rufigularis*).
Singing Honey-eater (*Ptilotis sonora*).
Plumed Honey-eater (*Ptilotis plumula*).
White-plumed Honey-eater (*Ptilotis penicillata*).
Black-throated Honey-eater (*Melithreptus gularis*).
Brown-headed Honey-eater (*Melithreptus brevirostris*).
Restless Flycatcher (*Sisura inquieta*).
Black-and-White Flycatcher (*Rhipidura tricolor*).
White-shafted Flycatcher (*Rhipidura albiscapa*).
Brown Flycatcher (*Micræca fascians*).
Hooded Robin (*Melanodryas bicolor*).
Red-capped Robin (*Petræca goodenovii*).
Rufous-breasted Thickhead (*Pachycephala rufiventris*).
Black-capped Tree-runner (*Neositta pileata*).
Redthroat (*Pyrrhuloxia brunnea*).
Yellow-rumped Tit (*Acanthiza chrysorrhoa*).
Chestnut-rumped Tit (*Acanthiza uropygialis*).
Brown Tree-creeper (*Climacteris scandens*).
Black-faced Cuckoo-Shrike (*Coracina robusta*).
Wood-Swallow (*Artamus tenebrosus*).
Red-tipped Pardalote (*Pardalotus ornatus*).
White-winged Wren (*Malurus leucopterus*).
Purple-backed Wren (*Malurus assimilis*).
Darker Turquoise Wren (*Malurus whitei*).
Welcome Swallow (*Hirundo neoxena*).
White-backed Swallow (*Cheramæca leucosternum*).
Tree-Martin (*Petrochelidon neoxena*).
Fairy Martin (*Petrochelidon ariel*).
Short-billed Tree-Tit (*Smicrornis brevirostris*).
Pallid Cuckoo (*Cuculus pallidus*).
Narrow-billed Bronze-Cuckoo (*Chalcococcyx basalis*).
White-browed Babbler (*Pomatorhinus superciliosus*).

Song-Lark (*Cinclorhamphus cruralis*).
 Lesser Bush-Lark (*Mirafra secunda*).
 Pipit (*Anthus australis*).
 Grey Shrike-Thrush (*Collyriocinclla harmonica*).
 Mistletoe-Bird (*Dicaeum hirundinaceum*).
 Silver-eye (*Zosterops caeruleus*).
 Whiteface (*Aphelocephala leucopsis*).
 White-fronted Bush-Chat (*Ephthianura albifrons*).
 Spotted-sided Finch (*Staganopleura guttata*).
 Chestnut-eared Finch (*Taniopygia castanotis*).

ADDITIONAL LIST.—Birds identified in the same district in August, 1911, but not seen in August, 1912:—

Swamp-Hawk (*Circus gouldi*).
 Orange-fronted Bush-Chat (*Ephthianura aurifrons*).
 Rufous Song-Lark (*Cinclorhamphus rufescens*).
 Crow (*Corvus coronoides*).
 Brush Wattle-Bird (*Anellobia mellivora*).
 Yellow Parrakeet (*Platycercus flaveolus*).
 Warbling Grass-Parrakeet (*Melopsittacus undulatus*).
 Bronze-wing Pigeon (*Phaps chalcoptera*).
 White-breasted Cormorant (*Phalacrocorax gouldi*).

Stray Feathers.

Regent-Birds in Orchard.—Four Regent-Birds (*Sericulus chrysocephalus*) recently took up their abode in an orange orchard near Bellingen, New South Wales. One pair built a nest in an orange tree and reared a brood. All the birds became so tame that they would hop into the kitchen in search of food. A report from Goulburn states that the imported Goldfinches are exterminating the spotted thistle in the vicinity of the town. Large flocks of the Finches are constantly feeding on the seed.—A. S. LE SOUËF. Sydney, 22/11/12.

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Cuckoo Records.—At Gerahmin, 14 miles north-west of Chillingollah, Victoria, on 15th September, 1912 (when in company with Messrs. J. A. Ross, T. H. Tregellas, and J. J. Searce), I found a nest of *Hylacola cauta* containing two eggs of the Wren and an egg of the Narrow-billed Bronze-Cuckoo (*C. basalis*). In the same locality, and on the same date, Mr. Ross found a nest of the Tawny-crowned Honey-eater (*Glycyphila fulvifrons*), which contained one egg of the Honey-eater and an egg of the Narrow-billed Bronze-Cuckoo.—F. E. HOWE. Canterbury (Vic.)

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Foster-Parents of Cuckoos.—I would like to mention the following foster-parents of Cuckoos:—Black-billed Fly-eater (*Pseudogerygone brunneipectus*) as foster-parent of Rufous-throated Bronze-Cuckoo (*Chalcococcyx pæcilurus*) and Little Bronze-Cuckoo (*C. malayanus*); Yellow-tinted Tree-Tit (*Smicrornis flavescens*) as foster-parent of *Chalcococcyx malayanus* (I think that *Smicrornis*

flavescens has never been recorded as a foster-parent of any Cuckoo; White-throated Honey-eater (*Melithreptus albigularis*) as foster-parent of Pallid Cuckoo (*Cuculus pallidus*)—this is probably a new foster-parent of the Pallid Cuckoo; while the Little Friar-Bird (*Philemon sordidus*) and Northern Oriole (*Oriolus affinis*) are foster-parents of the Koel (*Eudynamis cyanocephala*).—ALAN P. DODD. Nelson, *viâ* Cairns (N.Q.), 16/12/12.

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New Yellow Robin.—Many years ago at Coomooboolaroo, Dawson River district, Queensland, in the dry brigalow (acacia) scrub, I procured an *Eopsaltria* with the dull yellowish rump, which did not agree with the well-known southern form, *E. australis*. In due course the skin found its way into the National Museum, Melbourne. Recently, while examining material in connection with the "Check-list" Committee, the skin was re-examined, and is now separated sub-specifically from the Yellow-breasted Robin (*E. australis*).

It is remarkable that this (smaller) form of the southern bird should appear sandwiched, so to speak, between the two bright yellow-rumped varieties—*E. chrysorrhoa* (New South Wales and South Queensland) and *E. magnirostris* (North Queensland).

The new bird is named *E. coomooboolaroo* after the station of the Messrs. Barnard, whose names as field ornithologists, together with the name of their station, will become historical in the annals of Australian ornithology.

Eopsaltria coomooboolaroo (Lesser Yellow Shrike-Robin), in addition to its smaller size, differs chiefly from *E. australis* in the absence of the greenish (olive) tint on the mantle, outer edges of the primaries, secondaries, and tail feathers, which are all uniformly greyish. Dimensions in inches:—Length, 5.0; wing, 3.1; tail, 2.4; tarsus, 0.75; bill, 0.45.

For description of eggs see "Nest and Eggs," page 312 (second paragraph).—A. J. CAMPBELL.

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Many-coloured Parrakeet (*Psephotus multicolor*).—In a somewhat small cage (2 feet x 2 feet x 1 foot 6 inches) I keep a pair of Many-coloured Parrakeets, which nested in August last, but, owing to the cold weather or other causes, from a set of five eggs one young only was hatched, and that died when about a week old. The same pair again nested in October, and the female laid five eggs. The time that elapsed between the first egg being laid and the fifth was about a week. Four young were hatched. I should say incubation took 15 to 16 days, but, being loth to disturb the female when sitting, I cannot state exactly the term. It is now five weeks since I noticed the first one hatched. Three are well feathered, and fine birds, and sit on the edge of the box-nest, and two have already come to the bottom of the cage to-day, starting to feed. The female, when sitting, seldom leaves

the nest, as the male is very attentive in feeding her during that time. The green food I have given them has been "milk thistles"—flower and stalk. For the latter they seem to have a particular relish, and also for rye-grass in seed. For dry food, Canary seed *ad lib.*: hemp seed, about a teaspoonful four or five times a day, and a few grains of soaked maize at the same time; flaked oatmeal and wheatmeal biscuit always before them. When about to nest I give a free supply of animal charcoal (burnt bones, porous ones being preferred), but when rearing young charcoal crumbled small, and from the quantity that they eat there appears a great and important value to its properties.—T. HURST. Inkerman-road, Caulfield (Vic.), 12/12/12.

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Procellaria æquinoctialis mixta (Mathews' "Birds of Australia," vol. ii., part i., p. 111).—The following short notes from my own observations confirm this new sub-species. The first specimen was noted about 900 miles west of Albany (Western Australia) on 12th April, 1909, while I was travelling on a White Star boat homewards, and increasing numbers of these birds were daily observed until 19th April, when we were about 800 miles east of Durban (long. 45° E.), when no more were noted. On the return voyage this Petrel was first seen off Cape St. Francis, between Cape Town and Durban, when about 20 followed the steamer all day (10th December, 1909), and they increased in numbers daily until 17th December, when they were very numerous. The steamer then was in lat. 40° S., about 500 miles north of the Crozet Islands. On 24th December the Spectacled Petrels (and other species of birds that had constantly followed the steamer) became much less in numbers, and the last of the Petrels were seen on Christmas Day, when about 500 miles south-west of Albany. Several specimens were caught on both passages, and the colouration of the bill and soft parts, as given by Mr. Mathews on my authority, may be relied upon, as the colours were noted from living birds. Birds that were dissected appeared to have been feeding upon small squids (?), as great numbers of their beaks were found in the gizzards of the birds. On my voyage both to and from England I daily spent a considerable time in observing and making notes upon the Petrels, Albatrosses, &c., that accompanied the steamers, being assisted by powerful binoculars. Among the hundreds (probably thousands) of Spectacled Petrels that were under observation, not a single bird was seen with any white on the plumage except the chin spot, and this varied considerably in extent. *No specimen was seen with any white markings above the beak or on the face.*—TOM CARTER. Broome Hill (W.A.), 12/11/12.

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Descriptions of Eggs New to Science.—*Rallina tricolor*.—The identity of eggs of this species now being established beyond all doubt (*vide The Emu*, vol. xi., pp. 19 and 20, also *The Ibis* of

July and October, 1912, pp. 552 and 684), I claim that the clutch taken by Mr. H. G. Barnard, and recorded above, is the type.*

Nest.—A hollow in the ground, lined with a few dead leaves.

Locality.—Cape York. Date, 10th January, 1911.

Eggs.—Four, pure white, shape roundish oval, surface of shell smooth and glossy. Dimensions in inches:—(a) 1.55 x 1.11; (b) 1.5 x 1.13; (c) 1.5 x 1.12; (d) 1.55 x 1.15.

Ptilotis novæ-noriæ (Milligan).—Eggs of this species have been in my collection for some years, and I understood that they had been described before coming into my possession. A careful search, however, reveals no record.

Nest (taken by Mr. F. Lawson Whitlock at Dundas Goldfield, Western Australia).—A neat, cup-shaped structure of grasses, well lined with vegetable down, and placed about 3 feet from the ground in a small bush; situation, open country, free of large timber. Date, 1st August, 1905.

Eggs.—Clutch, two; shape, long oval; surface glossy, ground colour very light flesh, lightly spotted at larger end with a few dots and splashes of brownish-red. Dimensions in inches:—(a) .83 x .61; (b) .82 x .59.

A second clutch, obtained by Mr. L. G. Chandler, 6/9/12, near Kow Plains, North-West Victoria, is similar in shape and markings to the Western Australian clutch. The nest in this case was composed of bark with a lining of rabbit-fur; it was placed 2 feet from the ground in a wild myrtle tree. Dimensions:—(a) .85 x .58; (b) .81 x .59.

Another set taken by Mr. Chandler, 19/9/12, in the same locality, from a nest placed 4 feet from the ground in a tea-tree, consists of two eggs, much rounder specimens than those previously mentioned; almost devoid of markings, a few indistinct reddish specks only being noticeable at the larger ends. Dimensions:—(a) .78 x .6; (b) .78 x .61.—H. L. WHITE. Belltrees (N.S.W.), 7/12/12.

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Birds and Frogs, &c.—On 15th September I found a nest of the Tawny Frogmouth (*Podargus strigoides*) placed in a Moreton Bay fig-tree growing in the garden at Fairymead Plantation, near Bundaberg. The bird was sitting, and to my surprise would not leave the nest when I climbed the tree, and all efforts to induce her to do so were unavailing. Finally I put my handkerchief over her head, and so was able to gently extract the eggs from beneath her. They were fresh, although I had expected to find them heavily incubated. Desiring to test the power of the bird's beak, I placed my finger in the mouth. The pressure of her bill would scarcely have hurt a fly. Just then one of the boys on the ground below tossed me up a large green frog. This I placed in the bird's open mouth. There was an instant's hesitation, then the beak closed and the frog was swallowed. In a Tree-

* See *Emu*, vol. x., p. 244 (footnote).—EDS.

Swallow's (*Petrochelidon nigricans*) nest, built in a hollow gum branch, I found three young birds, partly fledged, and beside them was huddled a large green frog. Seeing some long feathers projecting from beneath the frog's body, I caught hold of them, and presently pulled out an adult Swallow, the female bird, apparently, which was much ruffled and rather dazed, but still able to fly. Had she endeavoured to resist the frog's intrusion and been overcome? It is certain that, without my aid, she could not have extricated herself. What was the frog's object in entering the nest? I do not think that it meant to make a meal of the young birds, for they were unharmed. I tried to eject the frog, but it crawled further down the hollow. I have observed several unusually large clutches this year, such as Scaly-breasted Lorikeet (*Psittenteles chlorolepidotus*), three eggs; Whistling Eagle (*Haliastur sphenurus*), three; White Cockatoo (*Cacatua galerita*), four; and Grey Jumper (*Struthidea cinerea*), six eggs. In contrast was the nest of a pair of Crows (*Corvus coronoides*), which I took at Fairymead, in company with Mr. Arnold Young. We were unable to dislodge the bird from the nest until I was half-way up the tree, when she dashed off. Usually a Crow leaves the nest while the intruder is some distance away. This nest contained only one egg, which was discoloured and showed every sign of long incubation. White Cockatoos were "thrown off their balance" this season by the winter rains. They nested in numbers in August, which I have never known them to do before. Usually in this district one can depend on the Cockatoos nesting almost to the day—about the second week in October.—ERNEST D. BARNARD. Gladstone, Queensland, 26/10/12.

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Flame-breasted Robin in Tasmania.—In the past autumn and winter I have kept careful records of the Robins, and find that, undoubtedly, the Flame-breast (*Petrarca phanicea*) remains with us all the year, as does the Scarlet-breast (*P. leggit*). On 15th April (1912) my journal records:—"Many Flame-breasts now in the paddocks about the town, some of the males with most vivid breasts; the colour seems, in many instances, brighter in the autumn than in the spring, owing, perhaps, to many of the young males donning their livery in the former season for the first time. 16th May.—Flame-breasts, in both red and grey plumage, feeding in newly-ploughed paddock, in which are also White-fronted Chats (*Ephthianura albigrons*) and Pipits (*Anthus australis*). 6th June.—Flame-breasts still in evidence, feeding in grass paddocks adjoining Don road. 7th June.—Four of the same species in splendid red, accompanied by several greys, seen in the morning, as well as a pair of Scarlet-breasts. 14th June.—A pair of Scarlet-breasts were perched on the overhead electric wire, the male singing. 18th June.—Two pairs Flame-breasts in small paddock, the males in fine red; others seen in a larger paddock. 20th June.—Two male Flame-breasts in plumage, with about half-a-dozen

greys, on a small piece of grass ground (about one-eighth of an acre). 26th June.—Male Flame-breasts in red, with a number of greys of same species, perched on electric wires over the Don road, inside the town boundary of Devonport. 17th July.—A pair of Scarlet-breasts perched on the same wires. 18th July.—A number of Flame-breasts, both coloured and plain, feeding in a ploughed paddock, with several Chats and a Pipit. One of the Flame-breasts very tame, feeding within a yard or two of where I stood. In the afternoon a party of five Pipits feeding together in a grass paddock off the Don road, so that several of these migrants have stayed with us. 21st July.—A number of beautiful Flame-breasts, with several greys, flying from stump to stump, and on the fences of a paddock with crop of young green stuff; the breasts of the full-plumaged males seem to glow as they sit on stumps or boulders, facing the afternoon sun. 25th July.—A male Scarlet-breast was singing his short strain near the Don road. More Flames seen to-day. (Two days afterwards more of the latter were noticed in a paddock, where also there were numbers of Chats.) 29th July.—A pair of Flame-breasts observed on the Parade, apparently mated. 30th July.—Heard a song which was almost certainly that of *P. phoenicea*; singer not actually sighted. 5th August.—Many Flame-breasts observed in a newly-ploughed paddock; some of these in grey plumage (probably the males of last spring) singing plaintively while perched on stumps. A pair of Pipits in same paddock. 15th August.—A pair of Flame-breasts, the male in red, chasing each other through the air; other pairs in the vicinity." It will thus be seen that this beautiful Robin is with us in numbers all through the winter, as well as his congener, the Scarlet-breast; in fact, the former far outnumbers the latter in this district in the cold season.—H. STUART DOVE. West Devonport (Tas.), 22/8/12.

* * *

Bird-Migration.—When travelling by steamer from Brisbane to Darwin, during the third week in October, a few migratory birds were noted. When passing along the inside of the Great Barrier Reef, from Townsville to Thursday Island, Nutmeg-Pigeons (*Myristicivora spilorrhoa*) were seen flying southwards on their way from New Guinea. The number in one company was generally small, from one pair of birds to possibly a dozen or two. The birds flew fast and straight, just above water level. They were silent, and were easily distinguishable at a distance. The large majority of birds seem to make the coast-line of Australia near Thursday Island, and do not go further south than the low-lying coral islands of the Barrier Reef, and usually not as far as the southernmost ones. Other companies make their landfall at different points along the northern coast, but not usually as far as North-Western Australia. To estimate the number of these birds which annually migrate from New Guinea to Northern Australia is difficult. The Nutmeg-Pigeons usually

nest on the low-lying coral islands off the coast. They fly across to the mainland early in the morning, to feed on the wild figs, nutmegs, and other berries, and return, in small flocks, about sundown. In these short journeys they usually fly higher than when migrating. Comparatively few birds nest on the mainland, and the nests are generally situated high above the ground. It is a somewhat bulky structure of twigs, occasionally lined with leaves. One egg forms the clutch.

Another bird which migrates at the same time as these Pigeons is the Bee-eater (*Merops ornatus*); but their manner of flight is different. They travel above the water at a height of from 50 to 100 feet, and fly with a wavy motion, similar to the Cuckoo, *Graucalus*, &c., frequently uttering their single note. They fly in flocks, and Cape York seems to be the landing-place of the majority. A lesser number land on the northern coast as far as North-Western Australia. The Bee-eater comes far south, reaching the northern districts of Victoria. It will be found nesting from that portion of the Australian mainland up to Northern Australia—evidence that an enormous number of birds migrate. The Nutmeg-Pigeon and the Bee-eater are the two purely southern birds which are usually seen on their migration. The White-tailed Kingfisher (*Tanyptera sylvia*) and other species have, as far as I know, not been observed; possibly they travel at a greater altitude, or journey at night. Approximately, it is only 80 miles across Torres Strait; but, although the distance is short, the work of flying against the continuous and sometimes strong south-east trade wind must be considerable.

A few birds alighted on the steamer at different times, having evidently become detached from their company; they remained for some hours, occasionally continuing their southerly flight the same day, but usually staying till night fell. They had always disappeared the following morning. Several Sharp-tailed Stints (*Heteropygia acuminata*) also rested on the vessel, and ran about on the canvas awning or deck-houses looking for food. They generally kept about the vessel for the same length of time as the Bee-eaters. On several occasions I saw flying past the steamer small flocks of Curlews (*Numenius cyanopus*) at a height of about 50 feet or more above the water. These birds did not appear to be more numerous at any one point than another. Evidently the Curlews arrive along the whole of the north coast, but probably are more plentiful at the eastern and western corners. Judging from the number of birds which go down the coast, I should say that the greater number of the migratory waders make the north-west corner of Australia their landfall. I was surprised to see several Long-billed Stone Plovers (*Orthorhamphus magnirostris*) flying southwards: they frequently flew singly, but occasionally in pairs, at a height of about 20 feet above the water. We were generally out of sight of land when the different species of birds were seen, but the number was very small, as it was late in the season, and the majority had already passed south.

When near land I observed Gulls (*Larus novæ-hollandiæ*), and further out at sea Terns and Gannets, following shoals of fish. Frigate-Birds (*Tachypetes minor*) were usually not far from land; I have never seen this bird on the water. Although they are such wonderful flyers, the Frigate-Birds are greatly averse to a strong wind, and on such occasions are usually noted on the lee side of some island. In anything approaching a cyclone they take refuge on the mainland or the islands, otherwise they are apt to be blown into the sea and drowned. Dead bodies of the birds are sometimes washed up on the beach after such wind. I wish that some person living on the northern coast of Australia would note the arrival and departure of migrants.

On the way from Queensland, not far from Cairns, the steamer passed close to a small, rocky island, which was not more than 20 feet above sea level, and measured about 25 feet x 10 feet. There was a hollow in the granite rock, and Edible-nest Swifts (*Salangana esculenta*)* were flying in and out. They were evidently breeding there. When about 10 miles outside the Barrier Reef, opposite the Capricorn Islands, we passed many thousands of Wedge-tailed Petrels (*Puffinus sphenurus*) feeding on and under the water.—D. LE SOUËF. Melbourne.

From Magazines, &c.

South Australian Zoological Society.—The thirty-fourth annual report of the South Australian Zoological and Acclimatization Society, a copy of which has been received, is an interesting publication, illustrated by fine half-tone plates. The report states that the Zoological Gardens at Adelaide have made good progress, and are highly popular. The gate receipts for the twelve months under review amounted to £1,346 9s. 3d.—a record in the history of the institution. Several important improvements were effected in the course of the year. A new flying cage for Magpies and a new cage for Scrub-Turkeys are mentioned. A list is given of the birds in the gardens. These include specimens of Australian Eagles, Owls, Parrots, Cranes, Pelicans, Swans, Ducks, and many smaller birds. The collection is of considerable interest.

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Queensland Museum Memoirs.—The *Memoirs of the Queensland Museum*, vol. i., was issued on 27th November, 1912, the editor being Dr. R. Hamlyn Harris, D.Sc., F.L.S., &c., the Director, who is local secretary of the R.A.O.U. for Queensland. The volume is well printed, and the illustrations are excellent. One of the plates depicts a bower of the Golden Bower-Bird (*Prionodura newtoniana*), from the Atherton Scrub, North Queensland, which was recently mounted in the bird gallery at the Museum. The

* More probably the Grey-rumped Swiftlet (*S. francica*).—EDS.

only article of special interest to ornithologists is that by Dr. T. Harvey Johnston, D.Sc., &c., on "New Species of Cestodes from Australian Birds." Four of these parasites are described. *Dilepis bancrofti* occurs "fairly frequently" in the Rosella Parrot (*Platycercus eximius*) in New South Wales and Southern Queensland. *Choanotenia zoniferæ* was taken from a specimen of the Black-breasted Plover (*Zonifer tricolor*) and *C. taylori* from the intestine of a Blue Wren (*Malurus cyaneochlamys*). *Zosteropicala clelandi* infests the White-eye (*Zosterops cærulescens*).

* * *

Lingering Migrants.—Referring to the singular fact that the migratory shore birds which build in the Northern Hemisphere have stayed here longer than usual, Mr. Hugh Riordan, of Geelong, confirms Mr. O'Shannasse's observations:—"On 3rd June, near Point Henry, Geelong, I saw a single Curlew Sandpiper in winter plumage with no other birds of any sort near him. There was a flock of about a dozen Little Stints (*Limonites ruficollis*), also in winter dress, on the beach, with at least one Double-banded Dottrel (*Ochthodromus bicinctus*) not in full plumage. There were also 15 or 20 Sea-Curlews (*Numenius cyanopus*). Again, on 8th June, I saw about the same number of Sea-Curlews. On 16th June, a Double-banded Dottrel, not in full plumage, on the ocean beach at Bream Creek.

"Some of your correspondents who are favourably situated may be able to throw further light on the movements of these particularly interesting birds. If it is found that some of them do actually remain with us in winter plumage throughout our winter, would it not suggest the possibility of these particular birds donning summer plumage, and breeding here in our next summer?"

Regarding the Sea-Curlews, which were noted as abundant last month, Mr. George Shepherd, observing them about Western Port, says:—"I have noticed that the Curlews are always with us before August is quite gone." That means that they have travelled to the Arctic circle, nested, reared their young, and returned with their young. How is it possible for that to take place this year? Any further notes on the subject from those who have a chance of observing shore-bird life about southern inlets will be most acceptable.—"Nature Notes," *Argus*, 5th July, 1912.

* * *

Sanctuaries for Tasmanian Birds.—In the course of an interview, reported in the *Daily Post* of 2nd August, 1912, Mr. Robert Hall strongly advocated sanctuaries for the native game of Tasmania. "Mr. Robert Hall said the preservation of the native game was a national question, in which all Tasmanians should take an interest. And yet how was it that all other

countries did something to conserve their fauna, and yet Tasmania was doing practically nothing? The Tasmanian Government certainly wished well in the matter, and it was trying to do something, but much more was necessary. Apart altogether from the interest which the country should have in preserving the native game, because of its economic connection with the people, it should be possible to set apart an area of land to be vested in trustees which could be used as a breeding ground. This would be a sure way of preserving the remnant of many of Tasmania's rare species. He could see no reason why Freycinet's Peninsula and Schouten Island, off the East Coast, could not be set apart for this purpose. In such a sanctuary the native fauna could be preserved from destruction. The whole question was one of utility, and that was why so much attention was being paid to it. At present the fauna of Tasmania was being eradicated, or at least most certainly being suppressed. On the mainland they had the dreaded fox, which was disturbing the balance of nature by ruining the useful ground fauna. Fortunately Tasmania was without this pest, and the mainland communities really looked to this State to preserve what is typically Australian, and what had made Australia zoologically famous. The sanctuary he suggested was nothing like as big as Wilson's Promontory. It was poor country from an agricultural point of view, and if there were any minerals in it, there was land as likely to be productive elsewhere in Tasmania a thousand times its area. There was only one small piece of land, of 200 acres, taken up on the area he suggested, so that if it was declared a sanctuary it would cause very little immediate interference with vested rights."

* * *

The Western Long-billed Cockatoo.—In *The Ibis* for October, 1912, Mr. Tom Carter, R.A.O.U., of Wensleydale, Bröome Hill, Western Australia, has an interesting article on the Western Long-billed Cockatoo (*Licmetis pastinator*). He states that this fine bird has disappeared from the districts where it formerly abounded, and seems to be nearing extinction. The following is an extract from his paper:—

"When corn is not obtainable, the Western Long-billed Cockatoo feeds largely (like its eastern form, *Licmetis nasica*) upon the bulbs and roots of various plants. One of its favourite foods is the bulb of a small species of sundew (*Drosera*) that grows as soon as winter rains fall, bearing a small white flower. The scarlet berries of a small creeping plant (the name of which is unknown to me) that grows abundantly on sand plains are also much eaten. Probably the March visits of the Cockatoos to the station are made in order to feed upon the newly-sown wheat-grains. The locality is mostly heavy timber country in its natural state, the nearest homestead to the eastward

being about 40 miles distant, and the country to the south and west being much the same accounted for the Cockatoos taking such heavy toll of Mr. Muir's crops.

"The breeding season commences apparently in September, continuing through October, when the young are mostly hatched. Two or three eggs is the usual clutch, and the nesting cavity is almost invariably in the ends of hollow limbs or in the main stem of large living red gum trees (*Eucalyptus calophylla*). Ring-barked trees (*i.e.*, trees purposely killed by the axe) were not chosen for nesting-sites, neither were the jarrah trees, which were more numerous than red gums and grew along with them.

"Several nesting-cavities came under my notice, evidently containing young birds, but all were in inaccessible situations (to me), and the station hands were too busy harvesting to spare the time to fell one of the giant trees. One hole was shown me, about 30 feet only from the ground, in the trunk of a very large red-gum, where a brood had been reared for three consecutive years. Apparently the young birds remain in the nesting-place until they are strong on the wing, as Mr. F. Muir said that he and some of his men had several times cut down a tree to obtain youngsters, and just as the tree was falling they had emerged and flown strongly away. One nest, from which a parent bird had been observed to fly on different occasions, was placed in a tall green (*i.e.*, living) red gum, surrounded on all sides by acres of gaunt dead trees. The sitting birds leave the nests rather wildily, and do not readily return.

"At the earliest signs of dawn, long before sunrise, the Cockatoos are on the wing, and are very noisy and restless throughout the day, feeding at all hours. On one occasion only did I see them show any degree of tameness. I was engaged in examining the old nest of a Shieldrake, which was placed about 25 feet from the ground in the hollow limb of a yate (eucalypt) tree, when two Cockatoos perched in the upper branches and exhibited great curiosity as to my doings. The tree was growing on the edge of the corn-crop, and doubtless the birds had settled in it, preparatory to a feed of corn, before they noticed my presence."

Member of the R.A.O.U. Honoured.—Mr. D. Le Souëf, C.M.Z.S., Director of the Zoological Gardens, Melbourne, has been elected a Corresponding Member of the New York Zoological Society. Mr. Le Souëf is the first citizen of the Commonwealth thus distinguished.

The R.A.O.U. Honours.—Dr. R. W. Shufeldt, U.S. Army, retired, Fellow A.O.U., C.M.Z.S., &c., contributor to Newton's "Dictionary of Birds," author of "Myology of the Raven" and numerous papers on avian osteology, and Mr. W. R. Ogilvie-Grant, chief of the Bird Department, British Museum, have been elected honorary members of the R.A.O.U.

South Australian Ornithological Association.

THE monthly meeting of the South Australian Ornithological Association was held in the Royal Society's rooms, Adelaide, on 29th November, 1912. The president, Mr. Edwin Ashby, was in the chair. In answer to a request from a resident of Kangaroo Island it was resolved that a suggestion be made that *Dacelo leachii* or *D. cervina* be introduced into the island. Mr. H. E. Laffer showed specimens from Roseworthy of *Neophema elegans*, *Glycyphila albifrons* (a new locality for this bird), *Rhipidura albiscapa*, *Cinclorhamphus rufescens*, and *Malurus assimilis*. Mr. M. S. Clark exhibited heads of the Wandering Albatross (*Diomedea exulans*) and Sooty Albatross (*Phæbetría fuliginosa*), and Dr. A. M. Morgan sterna of an Albatross, Prion, Tern, and Plover, the three latter showing a striking similarity. Mr. Edwin Ashby exhibited specimens of *Malurus pulcherrimus* and *M. elegans*, recently received from Western Australia, *M. lamberti*, collected by himself early in November in the Richmond Ranges (N.S.W.), and a series of *M. assimilis*, from South Australia, showing distinct variations in the blue shades. Mr. Ashby also showed specimens of *Malurus melanocephalus* and *M. cyano-chlamys*, both collected during the present month in the Richmond Ranges (N.S.W.) It was pointed out that the northern form of the latter species, as indicated by Dr. Sharpe, is much paler than the form inhabiting South Australia and Victoria. Skins of the southern form, *M. cyaneus*, and *M. cruentatus* were also shown for comparison. Mr. F. Robert Zietz exhibited, from the South Australian Museum collection, a series of the following Petrels:—*Oceanites oceanicus*, *Pelagodroma marina*, *Puffinus leucomelas*, *P. chlororhynchus*, *P. griseus*, *P. tenuirostris* (and an albino), *Estrelata neglecta*, *Macronectes gigantea*, *Prion vittatus*, *P. banksi*, *P. ariel*.

Bird Observers' Club.

THE monthly meeting of the Bird Observers' Club was held on Wednesday evening, 21st August, at the Mia-Mia Tea Rooms, Collins-street. Mr. D. Le Souëf, C.M.Z.S., occupied the chair. A letter was read from Major J. M. Semmens, Chief Inspector of Fisheries and Game, stating what action he had taken with regard to the complaints about illegal shooting of game during the close season. Mr. F. E. Wilson read extracts from the *Daily Mail* of 13th July, 1912, concerning the work being done by Mr. James Buckland in bird protection. The chairman stated that he had posted copies of Mr. Buckland's pamphlet on that subject to all the principal newspapers in Australasia and New Zealand, to members of the Federal and State Parliaments, and to other persons likely to be interested in the subject. The result of the ballot in connection with the proposed new rules for the Club was made known. After considerable discussion it was decided that the suggestions for which the majority had voted be adopted as new rules. Mr. A. J. Campbell stated that at the last outing of the B.O.C. to the haunts of the Lyre-Bird (*Menura victoriæ*) only five members attended. They had a delightful trip. Mr. Clarence Weber was unanimously elected a member of the Club. Mr. A. J. Campbell, on behalf of Mr. H. L. White, of Belltrees (N.S.W.), exhibited the type specimen of the Lesser Satin Bower-Bird (*P. minor*), described in Bulletin No. 3 of the R.A.O.U. The skin was obtained in December, 1903.

The "Murder-Bird."—I have just learnt that there is an "expedition" now at the Stirling Ranges, W.A., trying to obtain specimens of the "Murder-Bird." I forecast that it will prove to be either *Ninox connivens* or one of the still larger Owls. I was at the locality two years ago.—TOM CARTER.

Quails in Victoria.

THE Council of the R.A.O.U., in February, 1912, issued circulars concerning Quail to a number of members in the several States. The circular stated:—"In Victoria, the experiment is again to be made by the game authorities of opening the shooting season for Quails on the 15th February—earlier than in any other State. The Council of the R.A.O.U. would esteem it a favour if you would kindly send them a report as to the condition of Quails—*young, &c.*—in your district on the opening day." The questions asked were:—Were birds numerous? What species chiefly? Were young or eggs noticed? With due regard for the birds, when do you consider the season should open? The reports received have been tabulated as follows:—

| Locality. | Were Birds Numerous? | Kinds. | Were Young or Eggs Noticed? | When Should Season Open? |
|------------------|----------------------|-----------------|-------------------------------|---|
| Werribee .. | No | Stubble | Yes, young | 15th Mar. |
| Noorat .. | No | Stubble | Yes, young | 1st Mar. |
| Mortlake .. | Fairly | Stubble | Yes, young | 1st Mar. |
| Maryborough .. | No | — | Yes, young | — |
| Seymour .. | No | Stubble | Plenty young | During Mar. |
| Essendon .. | No | Stubble | No | 1st Feb. |
| Benalla .. | No | Brown, Stubble | No | 15th Feb. |
| Hexham .. | No | Stubble | Plenty young | 1st Mar. |
| Bacchus Marsh .. | No | Stubble | Few young | 1st Mar. |
| Dimboola .. | No | Stubble | None | 15th Feb. |
| Scoresby .. | No | Stubble | Lot half-grown | 1st Mar. |
| Winchelsea .. | No | Stubble | Lot half-grown | 1st Mar. |
| Camperdown .. | No | Stubble | Young | 1st Mar. |
| Apollo Bay .. | No | Brown, Stubble | No | 15th Feb. |
| Murrumbena .. | Fairly | Stubble | Eggs & young | 1st April |
| Trafalgar .. | Scarce | Stubble | Half-grown seen | 1st Mar. or later; advise year's protection |
| Werribee .. | Fairly | Stubble | Young | 1st April |
| Nhill .. | Scarce | Stubble | No | 1st Mar. |
| Geelong .. | Yes | Stubble | Yes, young & eggs | 1st Mar. |
| Colac .. | Fairly | Brown | Lots of young | — |
| Skipton .. | No | Stubble | Lots of young | 1st April |
| Rokewood .. | Fairly | Stubble, Little | No | 1st Mar. |
| Drouin .. | Scarce | — | — | 15th Feb., but advise two years' protection |
| Dingee .. | Fairly | Stubble | — | 15th Feb. |
| Sea Lake.. | No | Stubble | Young | 1st Mar. or later |
| Maffra .. | Yes | Stubble | Yes, in all parts of district | 1st Mar. |
| Warragul .. | Yes | — | Yes | 1st Mar. |
| Weerite .. | No | Stubble | Yes, plenty | 1st Mar. |
| Lindenow .. | Fairly | Stubble | No | 1st Mar. |

| Locality. | Were Birds Numerous? | Kinds. | Were Young or Eggs Noticed? | When Should Season Open? |
|-----------------|----------------------|----------------|-----------------------------|---|
| Yea | No | Stubble, Brown | No | 1st Mar., but protected wholly for year |
| Gisborne .. | No | Stubble | No | 1st Mar. |
| Toora .. | Fairly | Stubble | No | 1st Mar. |
| Wedderburn .. | No | Stubble | No | 15th March; year's protection |
| Terang | No | Stubble | Young seen | 1st Mar. |
| Rosebrook .. | No | Stubble | Young seen | 1st April |
| Woodside .. | No | Stubble | Eggs & young | 1st or 15th Mar. |
| Nhill | No | Stubble | Eggs & young | 1st Feb. |
| Edenthorpe .. | No | Stubble | No | — |
| Healesville .. | No | Stubble, Brown | No | 15th Feb. |
| Warrnambool .. | No | Stubble | Yes, few | 1st Mar. |
| Somerville .. | Fairly | Stubble, Brown | Young Brown seen | 1st Mar. |
| Beaconsfield .. | No | Painted | — | 15th Mar. |

1st Feb., 2 15th Feb., 6 1st Mar., 24 15th Mar. and later, 7
42 returns, 39 give dates. 4 request a year's rest for birds.

OTHER STATES.

| Locality. | Were Birds Numerous? | Kinds. | Were Young or Eggs Noticed? | When Should Season Open? |
|------------------|----------------------|--------------------------|-----------------------------|----------------------------------|
| Fulham, S.A. .. | Fairly | Stubble | Young seen | 1st Mar., as is the case in S.A. |
| Kalangadoo, S.A. | Scarce | Stubble | No | 1st Mar. |
| Yungaburra, Q. | No | — | Young seen | 31st Mar. |
| Cobbarah, N.S.W. | | None seen for some years | | |
| Corowa, N.S.W. | | None seen for some years | | |
| Bundaberg, Q. .. | Scarce | — | Yes, young | 31st May |
| Cunnamulla, Q. | None | — | — | 31st Mar. |
| Tayendale, Q. .. | No | — | — | — |
| Rockhampton, Q. | Fairly | — | Yes, young | 1st Mar. |

Major J. M. Semmens, Chief Inspector of Game and Fisheries for Victoria, held a conference at his office, Melbourne, on 16th December, 1912, to determine the proper date for opening the Quail season. Delegates were present from the Field Naturalists' Club, Bird Observers' Club, R.A.O.U., gun clubs, and other associations. After debate, the delegates were unanimous in the opinion that the 1st of March should be recommended as the opening date. The conference elicited one most important fact—namely, that the Painted Quail (*Turnix varia*) and Brown or Swamp-Quail (*Synæcus australis*) were becoming alarmingly scarce, and complete seasons of rest were suggested for these species.

Notes on *Epthianura lovensis* (Ashby).

By GREGORY M. MATHEWS, F.R.S.E., WATFORD, ENGLAND.

THIS most interesting addition to the desert avifauna of Australia was described by Mr. Edwin Ashby in *The Emu*, vol. x., p. 251 (1911), under the above name, with the proviso—"It may, after further investigation, exhibit generic differences."

In the *Agric. Gazette, New South Wales*, vol. xxii., p. 211 (1911), Mr. A. J. North therefore introduced for it the genus name *Ashbyia*. The same author, in the *Proc. Linn. Soc. N.S.W.*, 1911 (26th April, Abst., p. 11), amplified the diagnosis of the genus, and noted:—"The genus *Ashbyia* is allied to *Epthianura*, but the latter may be distinguished by its more slender and pointed bill, its shorter wing and different wing formula, and by its longer upper tail coverts."

The type specimens are now before me, and I would accept their very close relationship with the genus *Epthianura* as broadly understood, and in my "Reference-List" I included them in that genus.

As Mr. Ashby indicated, its nearest ally would seem to be *E. crocea*, from which it is easily distinguished by the characters Mr. Ashby points out.

A careful examination of the *Epthianura* in connection with this species reveals a few matters of interest. The type of *Epthianura* (Gould) is the *Acanthiza albifrons* of Jardine and Selby. Though the males of *E. albifrons* (Jard. and Selby) and *E. tricolor* (Gould) are quite unlike in colouration, they have dull-coloured females which somewhat resemble each other, the red rump of the latter being the most noticeable feature. From both of these species the male of *E. aurifrons* (Gould) absolutely differs in its colouration; but here again the dull female is not so very dissimilar, the red rump being replaced by a yellow one, while a yellowish-green wash pervades the lower surface.

E. crocea (Castelnau and Ramsay) recalls the preceding species in the style of colouration of the male, while the female is not so markedly different, the yellow rump being present, while on the under surface the yellow is mainly restricted to the flanks, lower abdomen, and under tail coverts, where, however, it is not so noticeable as in the preceding species.

The present species would be referable to this group by its colouration, though it is easily characterized by its superior size and heavy bill. In its upper colouration it lacks the yellow rump, and it has the under surface more distinctly greenish-yellow throughout, this colour reappearing on the lores and on the supercilious eye-streak, though a buff tinge washes the sides of the breast.

There seems to me to be only two courses open in the treatment of these birds—either the inclusion of the whole of the species in the genus *Epthianura*, or else the recognition of four genera. In my "Reference-List" I adopted the former course,

but my recent monographic studies have convinced me that such was the incorrect policy. The entirely different colouration of the males has more significance than the apparent similarity of the so-called structural characters, and it is necessary to judge all species upon the combined value of both colouration and structure, and I am therefore employing both in my acceptance of generic names for Australian birds for the future.

If we examine the colouration of these birds we have three different styles—the first, *E. albifrons* (Jard. and Selby); the second, *E. tricolor* (Gould); and the third, *E. aurifrons* (Gould), *E. crocea* (Castelnau and Ramsay), and *E. lovensis* (Ashby). When these groups are examined for structural differences it is seen that such exist, and, moreover, that the last three, which somewhat agree in colouration, also have their structural features more closely resembling. *E. tricolor* (Gould) has its bill longer and more slender than in *E. albifrons*, while it has shorter claws, and, though the wing is as long, the first primary is appreciably shorter. The other three have all more curved bills and shorter, more rounded wings, with comparatively longer first primaries, and more slender legs. In this group again *E. lovensis* (Ashby) can be differentiated by its larger size, heavy bill, &c., as characterized by Mr. North. I am therefore proposing to use the following generic names for these birds:—

Epthianura (Gould) for *E. albifrons* (Jard. and Selby).

Parepthianura (nov.) for *E. tricolor* (Gould).

Aurepthianura (nov.) for *E. aurifrons* (Gould) and *E. crocea* (Castelnau and Ramsay).

Ashbyia (North) for *E. lovensis* (Ashby).

There is a lot of work to be done in connection with this group, as in the "Hand-list Birds Brit. Museum" they are constituted a sub-family of the family *Turdidæ*, while North, when introducing *Ashbyia*, placed it in the family *Timeliidæ*—"the ornithologist's waste-paper basket." In the vernacular they are called "Chats," but their systematic position cannot be considered settled.

A note of explanation is necessary in connection with the accompanying plate. Through the death of the colourist engaged upon the plates it became necessary to employ another worker, and in consequence they all appear darker than the originals. This, however, may not be a fault, because the female, as Mr. Ashby noted, is moulting, and the new feathers are coming darker than the old ones. As the male was killed a month earlier, it is still in its old worn and faded plumage. It may, therefore, be that the plate will approximate somewhat more closely to the new plumage of this species than it does to the type specimens.

Mr. Ashby, South Australia, obligingly supplies some field observations concerning the new bird:—

"I am indebted to my friend, Mr. J. R. B. Love, for the information contained in the following notes:—

"*Occurrence*.—The first specimen seen was an isolated male, in the last week of October or the first week in November, 1910, in the neighbourhood of Leigh's Creek, South Australia. A flock of about 20 was seen later in November, and later on, in December and early January, between Hergott Springs and the River Cooper, several pairs were seen throughout the 90-mile journey, running on the ground or occasionally flitting across the track—in all, perhaps 20.

"*Nature of Country*.—The ground is dull red, covered thickly with stones the size of a marble to that of a plum, with salt-bush or blue-bush, say 3 or 4 feet apart. In the stretch between Hergott Springs and Cooper's Creek the country is typical "gibber plain," and the stones are more rounded and set closer together than near Leigh's Creek.

"*Habits*.—The habit of this bird separates it at once from any of the genus *Ephthianura* with which I am acquainted. It is always seen in the open country—either 'gibber plain' or open, stony hillside—running on the ground, bobbing its tail up and down in the same manner as the Australian Pipit (*Anthus australis*). So closely do its actions resemble that bird that at first I thought it possible that the tail was not fully developed, for it seemed strangely short for a bird that so closely resembled the Pipit in its actions. I have never seen a Wheat-ear, but from the written descriptions of the habits of some of the species occurring in Africa one would expect some relationship between them and the species under review. On one occasion a small boy saw one of these birds run into a rabbit-burrow, and, the burrow being short, he caught the bird in his hand, and took it home and fed it on Canary seed, which it ate, but after two days died, and, unfortunately, was thrown away. One of the specimens shot likewise ran down a rabbit-burrow after being hit, which suggests that this habit may be common to the species.

"*In Conclusion*.—The last time this bird was met with was Easter, 1911, near Leigh's Creek, when a single bird was seen. The prevalence of drought conditions since that date has prevented its recurrence in that locality.

"An observant bushman described the nest as being very similar in situation and structure to that of the Pipit (*Anthus australis*)."

Notes and Notices.

Osprey (Egret) Plumes.—The Duchess of Portland, writing to *The Times*, 23rd August, states:—"My attention having been called to the fact that mounts of real osprey were recently advertised for sale, I beg that you will allow me through your column to implore my countrywomen to refrain from purchasing this particular kind of head-dress. I am afraid ladies are not generally aware of the dreadful suffering caused in procuring these feathers. The milliner's osprey (French, *aigrette*) grows on the back of the White Heron or Egret, and then only in the breeding season, when their nests are congregated together in large numbers. Thus, the birds, although alarmed on the approach of the hunters, are unwilling to leave their offspring, and fall an easy prey to the guns, after which the coveted feathers are plucked from their

bodies. But what of their young? They, cruelly deprived of their parental support, and having themselves no feathers of any value, are left to die the horrible death of slow starvation. These are the circumstances I wish to point out, and why I would ask all men and women to discourage the wearing of osprey plumes, for if there were no demand the supply would soon cease. I am glad to read in a leading London newspaper, commenting on the millinery taken to India by Queen Mary in the recent tour, that her Majesty had never worn a real aigrette, and had given special instructions that nothing of the kind should be employed in her millinery. This example will, I earnestly hope, be followed when the facts are known."

Lighthouses and Birds.—Two reports from lighthouse-keepers have been forwarded to the hon. secretary of the R.A.O.U. by Mr. J. Adams, Secretary to the Marine Board of Hobart.

W. A. Campbell, superintendent of the Eddystone Point lighthouse, reports:—"Re birds striking the tower. 10th September, 1912, 4.50 a.m., a Blackbird struck the tower, and continued to do so till daylight, when it disappeared. Again on 13th October a bird (Mutton-Bird) struck the tower. Found this bird dead at the base of the tower."

The following is a list of birds which hit the tower of the lighthouse on Goose Island, as observed by C. Carlson, the superintendent:—12th August, 2.35 a.m., Starling. 16th August, 3 a.m., Red-breasted Robin. 6th September, 1 a.m., Brown Thrush. 9th September, 3.5 a.m., not seen; 3.30 a.m., Starling; 4.30 a.m., Brown Robin; 4.40 a.m., Cuckoo or Summer-Bird; 4.50 a.m., Brown Thrush and Dusky Fantail; 5 a.m., Cuckoo, Brown Thrush, Fantail. 12th September, 7.45 p.m., Brown Thrush. 29th September, 11 p.m., Brown Robin; 11.40 p.m., Brown Thrush and bird unseen. 4th October, 1.15 a.m., Fantail. 6th October, 10.20 p.m., Ground-Lark. The Mutton-Birds were not put down, as they hit the tower too frequently.

The Turquoise Parrakeet.—As an aviculturist and a member of the Union, I should like to draw attention to the disappearance from the bird markets during the last twenty years of the beautiful little Turquoise Parrakeet (*Neophema pulchella*), which is easily bred in captivity and can be kept with the smallest Finches without fear of accidents. It seems likely that this little bird has gone the way of the Dodo and the Passenger Pigeon, and certainly it may be placed, as far as aviculture is concerned, on the extinct list. But there may still be a few specimens in the wilder parts of Australia, and it would, I think, be of interest to hear something about them. I would suggest that if the birds are found a few specimens should be taken to one of the Zoological Gardens in Australia for breeding purposes. According to Mr. Seth-Smith, this species was bred in considerable numbers in the London Zoological Gardens between 1860 and 1883. In Gould's day the Turquoise Parrakeet seems

to have been common. He says that, during his rambles, his attention was constantly attracted by the bird's beautiful outspread tail and wings as it rose before him. If our worst fears are realized, and this bird has gone for ever, I think it would be of interest to ornithologists all over the world if a short history of the species were published in *The Emu*.—W. H. WORKMAN, M.B.O.U. Belfast, Ireland.

[Mr. Workman's note from afar has raised an important question—Does this beautiful ground-loving bird still exist in the flesh? If so, it would appear to be very scarce. And Mr. Workman's suggestion is a good one, that observers should send notes concerning this species for publication in *The Emu*. In Gouldian days the habitat of the Turquoise Grass-Parrakeet was South-Eastern Australia.—EDS.]

Western Australian Game Laws.—Mr. Tom Carter, of Broome Hill, Great Southern Railway, Western Australia, forwards a copy of a bill for "An Act to Consolidate and Amend the Laws Relating to Imported and Native Game" (in Western Australia). One of the clauses provides that no living imported or native game shall be exported from the State unless with the written consent of the Minister, and every person who exports or attempts to export any such game without consent is liable to a fine not exceeding £20. The measure also provides that the Governor may from time to time, by proclamation, declare that any bird or animal indigenous to Western Australia shall be at all times strictly preserved, either generally throughout the State or in any one or more portions thereof.

Notice.

OFFICIAL CHECK-LIST OF THE BIRDS OF AUSTRALIA.

Referring to pages 145-6 in this issue of *The Emu*, it will be noticed that this very important and difficult work has been accomplished by the committee specially appointed by the R.A.O.U.

In a few weeks the Council will publish and issue the "Check-list" as a Supplement to *The Emu*. The Supplement, really an extra part, is published at considerable expense, and members are requested to forward to the hon. treasurer (Mr. Z. Gray, L.C.A., 190 Bridport-street, South Melbourne, Victoria), the sum of 2s. 6d. each on receipt of their copies.

At the same time the hon. treasurer begs to intimate that he will be glad to receive outstanding ordinary subscriptions for the current year, ending June.

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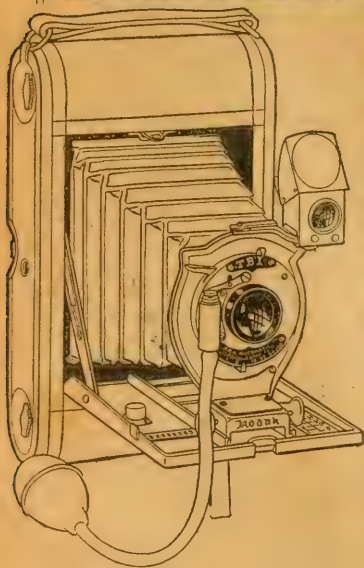
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The Emu

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The Emu

Official Organ of the Royal Australasian Ornithologists' Union.

"Birds of a feather."

VOL. XII.]

1ST APRIL, 1913.

[PART 4.]

On the Comparative Osteology of *Cereopsis novæ-hollandiæ*.

BY R. W. SHUFELDT, M.D., WASHINGTON, D.C.

THERE is at present, so far as I am aware, no complete account of the skeleton of the Australian Goose described by Latham as *Cereopsis novæ-hollandiæ*, wherein its characters have been compared with those to be found in the skeletons of other species of Geese. This extraordinary fowl is now on the road to extinction, and it is important that we should possess a reliable account of its osteology. Eyton, in his Supplement to his "Osteologia Avium," presents the right lateral view of a more or less complete skeleton of an adult specimen of *Cereopsis* (unnumbered); but it is merely a sketchy affair, drawn by Mr. G. Scharf, and of little value beyond giving a general notion of the articulated skeleton of a specimen of this species.

What Eyton has to say, in his general work, with respect to the osteology of *Cereopsis novæ-hollandiæ*, is very little, more or less unscientific, and, in some respects, quite incorrect. What he says would lead one to suspect that *Cereopsis* was like *Plectropterus gambensis* in the matter of its skeletology, which, as we know, is not so.*

Sharpe, in his "Hand-list of Birds," places *Plectropterus* and *Cereopsis* in two distinct sub-families (*Plectropterinae* and *Cereopsinae*, vol. i., pp. 208 and 210), and the morphology of the two forms stands for the correctness of such a taxonomical arrangement.

My ability to furnish an account of the osteology of *Cereopsis* is entirely due to the courtesy of the United States National Museum, and to Dr. Charles W. Richmond, of the Division of Birds of that institution, for the loan of not only the necessary material for the purpose, but a large series of other skeletons of Ducks, Geese, and Swans, wherewith to make a comparative study of this remarkable Australian anserine. The material in question consists of a complete skeleton of *Cereopsis novæ-hollandiæ*

*Eyton, T. C., "Osteologia Avium; or, A Sketch of the Osteology of Birds," Lond., 1867, p. 204. Plate in the Supplement (1869), where, though it is unnumbered, it is No. 2.

(No. 19,711, Coll. U.S. Nat. Mus.), and some of the vertebræ, the femora, hyoid, and upper part of the trachea of another adult specimen (No. 19,734, Coll. U.S. Nat. Mus.) Then there are at hand more or less complete skulls and skeletons of a large number of Ducks; of species of Mergansers; of *Branta*, *Olor*, *Anser*, *Chen*, *Chloëphaga* (*hybrida* and *poliocephala*), *Cygnus*, *Hymenolæmus malacorhynchus*, *Chenonetta jubata*, *Dendrocygna* (two species), *Tachyeres cinereus*, and others.

SKELETON OF CEREOPSIS NOVÆ-HOLLANDIÆ.

The Skull.—There is no existing form of Goose that I know anything of which possesses a skull at all resembling that part of the skeleton in *Cereopsis*. No Goose in the avifauna of North America has one at all like it; while in South America the skulls of some of the Geese which have been relegated to the genus *Chloëphaga* come nearer to it, but even in their case the similarity is by no means at all close. (Fig. 1, Plate XXVIII., fig. 18, Plate XXX., and fig. 19, Plate XXXI.)

For the size of the bird, the skull in *Cereopsis* is small, while, at the same time, it is comparatively broad and massive. When viewed from above, it is to be observed that the vault of the cranium is smooth and rounded, with barely any evidence of the presence of a mid-longitudinal furrow. This also obtains in *Chloëphaga hybrida*, but not so in *Chloëphaga poliocephala*, in which Goose the median furrow is more pronounced. In *Chenonetta jubata*, and, to a somewhat less degree, in *Hymenolæmus malacorhynchus*, while the vault is smooth and rounded upon this view of the cranium, there are likewise hemi-ellipsoidal elevations present, corresponding to concavities within for the accommodation of the cerebral lobes. (Fig. 3, Plate XXVIII., fig. 12, Plate XXIX., and figs. 17, 18, Plate XXX.)

One of the most remarkable characters on the upper view of the skull in *Cereopsis* is the presence of the very extensive "supra-orbital depressions." These are rather shallow, but very wide, and extend well forwards and backwards. For some distance, mesially, they are separated from each other by about 2 millimetres—the separating surface presenting no elevation, but lies in the same plane with the general superficies of the top of the skull. (Fig. 18, Plate XXX.)

Chloëphaga hybrida possesses the most elaborate supra-orbital depressions. They are more profoundly sculpt and extensive in this species than they are in representatives of other groups of birds, where they are a common character. In this Goose they are not only deep, with rugose surfaces, but they meet in the middle line for over a centimetre and a half. They sweep round to the parieto-frontal region posteriorly, while anteriorly they are most profoundly impressed to a point on either side beyond the frontal insertion, or articulation, of the lacrymal bone. The free edge they create anteriorly is usually serrated and jagged,

being concaved posteriorly on either side of the middle line of the skull.*

Quite different from *Chloëphaga hybrida* is *Chloëphaga poliocephala* in this respect, for in it the supra-orbital depressions are shallow, rather far apart, and little more than narrow trimmings of the supra-orbital peripheral margins, as far forwards as the articulation of a lacrymal bone on either side. (Fig. 4, Pl. XXVIII.) These depressions are still less conspicuous in species of the genera *Anser*, *Chen*, and *Branta*, while in *C. jubata* they are slightly more evident, but very narrow. *Hymenolæmus malacorhynchus* has them not at all, and *Tachyeres cinereus* has them extensive, but very shallow, though in this bird they give rise to an evident mesial crest, extending from the frontal region backward to the parietal.

None of the foregoing among the Geese possesses any movability to the "cranio-facial hinge." It is absolutely rigid in all save *Chloëphaga hybrida*, in which species, in the case of the skull before me, it is perfect (No. 1,820, Coll. U.S. Nat. Mus.). Nevertheless, the transverse line of the suture in this region usually persists throughout life in all these forms, and in most of them, in the middle line in this region, we may discern the sutural traces of the naso-frontal processes of the premaxillaries. Exceptions to this are to be seen in *Branta c. hutchinsi* (No. 7,357, Coll. U.S. Nat. Mus.), and they are very faint in *Cereopsis*. (Fig. 18, Plate XXX.)

Taken in its entirety, the *superior mandibular* portion of the skull exhibits a very considerable amount of variation in the several genera of Geese to which I have referred in the foregoing paragraphs. As may be observed by examining the several figures on the plates, in *Cereopsis novæ-hollandiæ* this facial part of the cranium is relatively short, while, at the same time, it is markedly broad and deep. Either external *narial aperture* is broadly elliptical and of great size—so large, indeed, that the naso-premaxillary part of the superior mandible above them is mounded up, more or less convex, externally, and is unusually wide, transversely, between these narial apertures. This elevated portion slopes down in front, more or less abruptly, a short distance behind the broadly-rounded termination of the superior mandible (fig. 1, Plate XXVIII.), the terminal area, superiorly, showing the usual scattered group of nutrient foramina.

Laterally, the tomial margins are both sharp and deep, and the osseous roof of the mouth between them is profoundly concaved. Mesially, this latter may exhibit a small, slit-like foramen, which, in some Geese, is of elliptical outline and of great size, as in *Tachyeres cinereus*. Where small, the roof of the mouth is nearly

* Shufeldt, R. W., "Contribution to the Study of the 'Tree-Ducks' of the genus *Dendrocygna*." Plate XI., fig. 35 (in MS.) This memoir, when published, will, on thirty-five plates, give figures of skulls and other parts of the skeleton of a large number of the *Anseres* from various regions of the world.

entirely completed in bone; but where it is large, this antero-palatal portion of the cranium is correspondingly lacking in osseous completion, and so more or less weak in structure.

Cereopsis possesses only a partial *nasal septum* performed in bone, and this, in the adult, is confined to the posterior rhinal space, between the nasals, and somewhat anterior to them.

As will be noted from an examination of fig. 23, Pl. XXXII., the facial part of the cranium in *Tachyeres cinereus* has an aspect more after the order of what we see in the skull of an average Goose than has the corresponding cranial region in *Cereopsis*, for in *Tachyeres* the line of the culmen—from the concave fronto-cranial area, situated mesially between the long, forward-projecting portions of the lacrymals to the anterior extremity of the superior mandible—is very gently concaved, as it is in most species of *Anser* and *Branta*. *Tachyeres*, too, has large, elliptical external narial openings, with a complete absence of any osseous nasal septum. The osseous tomia are thin and very sharp-edged, while the sides of the mandibular walls are deep in this species, and the distance between them considerable, thus rendering the concavity formed by the bones of this upper mandible on its lower side unusually spacious.

Chen hyperboreus has an osseous superior mandible very different from this, and even more so as compared with that part of the cranium in *Cereopsis*. *Chen* has this part of its skull—which is in keeping with all the rest of it—thick and strong. From its basal portion to its apex it tapers considerably to the rounded extremity, and the line of the blunt edge of either osseous tomium is convex upwards for its entire length. The osseous *nasal septum* is imperfect in this Goose, and what there is of it is situated posteriorly above the maxillo-palatine mass. Either external narial aperture is large and subelliptical, and the distance between them, superiorly, narrow at its middle part. The concavity on the under side of the superior mandible is shallow, and the surface roughened. The mesial foramen occurring there in so many of the *Anseres* is usually very small in this genus. Between the apex and the ending of the maxillo-palatine mass posteriorly, in the mid-longitudinal line, there is a long, deep furrow; while on either side of this, between it and the tomial border, there is a chain of roughened tubercles. Each commences where the palatine of the same side is inserted, and terminates at a point about half-way to the apex, being largest posteriorly, and becoming gradually smaller to their anterior disappearance. No other Goose known to me possesses these, and there is not the slightest evidence of their presence either in *Anser* or *Branta*.

On either side the *infero-posterior process of the premaxillary*—by some called the *nasal process* of that bone—is produced backward in the skulls of many species of Geese, but not in all. It is conspicuously so in *Tachyeres*, *Anser*, *Branta*, *Chen*, *Hymenolanius*, and *Chloephaga poliocephala*, but much less so in *Chloephaga*

hybrida, to be entirely absent in *Cereopsis*, where that apophysis is completely rounded off.

Hymenolæmus malacorhynchus has a thin and fragile superior osseous mandible—elongate, with comparatively small external narial apertures; sharp tomia; deeply concaved on its under side, and with its distal end squared rather than rounded as in the Geese. (Fig. 3, Plate XXVIII., fig. 17, Plate XXX., fig. 20, Plate XXXI.)

Viewing the skull of *Cereopsis* on its posterior aspect, we are to note that the usual landmarks, often found there in the avian cranium, are but feebly pronounced. The entire area is more or less globular or rounded, with the *occipital ridge* and the *crotophyte fossæ* but faintly defined. The *supra-occipital prominence* hardly exists as an independent elevation, while the foramen on either side of it is extremely, or at least very unusually, small. Of good size, the *foramen magnum* is subcordate in outline, and the condyle for the atlas notched on its upper side in the middle. *Anser albifrons gambeli* has all the characters at the back of its cranium in complete agreement with what I have just given for *Cereopsis*. To a large extent, this applies to *Chen hyperboreus*; but in the genus *Chen* the occipital ridge may be somewhat better defined, though it is not always so. In *Branta* this is invariably the case, while the *occipital prominence* is far more conspicuous in members of that genus, especially in *Branta canadensis*.

In *Tachyeres cinereus* the posterior aspect of the cranium differs, in each and every character, from what we meet with in *Cereopsis*; for in the former the *crotophyte fossæ* are deep and sharply defined; the *occipital ridge* prominently produced; the *occipital prominence* much elevated, and the large, vertically elliptical foramen on either side of it seems, with respect to its presence and absence, to depend upon age in this Goose, as it may in other genera of this group. In the skull of one individual of this species at hand (No. 1,819, Coll. U.S. Nat. Mus.) these foramina are almost entirely absorbed, being quite minute, with the prominence standing between them of slight elevation. On the other hand, in another skull they are, as I have stated above, large and elliptical in outline, with the *supra-occipital prominence* much better defined (No. 1,818, Coll. U.S. Nat. Mus.) (Fig. 23, Pl. XXXII.) In both these skulls the *foramen magnum* is somewhat acutely cordate in outline, the apex being above. This is likewise its form in *Hymenolæmus malacorhynchus*—that is, in the skull at hand, wherein, too, the shallow *crotophyte fossæ* are extensive, especially below.

Regarding the skull of *Cereopsis novæ-hollandiæ* in lateral view, we observe that the *aural aperture* or *external auditory meatus* is large and open, with its periphery of a subcircular outline (Fig. 1, Plate XXVIII.) A lengthy *sphenotic process* is developed, directed downward and forward, terminating in a free, truncate apex, at a distance of some 5 or 6 millimetres from the apex of the descending process of the lacrymal. So far as I am aware, these

processes never meet each other to thoroughly co-ossify at their point of meeting, as they do in the Ducks of the genus *Dendrocygna*, where the sphenotic process and the lacrymal fuse together at their apical union, forming a complete osseous orbital ring, as in Parrots.

In *Chloëphaga hybrida* not only is the stout sphenotic process much lengthened, but the descending process of the lacrymal is considerably more so, and that to an extent to curve round toward the apex of the sphenotic, beneath the eye, and come within 2 or 3 millimetres of meeting with it at its apex. This is not nearly so much the case in *Chloëphaga poliocephala*, where quite an interval separates them. (Figs. 2 and 4, Plate XXVIII.) The interval between the apices in these processes is still greater in *Tachyeres cinereus*, in which species the big lacrymal bone has its free descending process ending in a circular expanded tip, which apparently has no inclination for backward extension. This is equally true for *Hymenolæmus malacorhynchus*. In the genera *Chen* and *Anser* the two processes in question are far separated, and, instead of there being any inclination for them to meet and fuse together, the end of the descending process of the lacrymal is frequently directed forwards (*Chen hyperboreus*).

In *Branta canadensis* the sphenotic process is large and very long; but it exhibits no inclination to meet the lacrymal bone, the apex of the descending portion of which is expanded and sometimes bifid, or even trifid (No. 17,980, Coll. U.S. Nat. Mus.)

All anserine birds, in so far as my observations carry me, have the *lacrymal bone* very large, and to this rule *Cereopsis* forms no exception. Here it thoroughly co-ossifies with all the surrounding bones with which it comes in contact, as the frontal, the nasal, and, to a slight extent, mesially, with the thin, shell-like *pars plana*, which is thrown out against it from within.

In *Tachyeres cinereus*—one of the *Fuliginæ* in which the *pars plana* in no way ossifies—the very large lacrymal is much compressed in the lateral direction, and its anterior extending process is conspicuously long, as of necessity it must be in order to reach the nasal of the same side, with which bone it usually articulates by an open suture.

There is likewise a very poorly developed *pars plana* in *Chloëphaga hybrida*—a species in which the upper portion of a lacrymal is enormous, being much compressed from side to side, and of a triangular outline. Both in *Chloëphaga hybrida* and *C. poliocephala* there is a pneumatic foramen present, at the antero-external aspect of the lacrymal at its lower part. It may also occur in other Geese, but is not so evident in them, while in *Branta canadensis* I do not find it at all.

Hymenolæmus malacorhynchus possesses a very considerable *pars plana*, it being a double, shell-like formation, completely separating the orbital cavity from the rhinal chambers. In *Anser a. gambeli* it is incomplete below, as it likewise is in *Branta*

c. hutchinsi, while in *Chen hyperboreus* it may be entirely absent in the adult.

Usually, the *inter-orbital septum* is very completely ossified, as it is in *Cereopsis*, where it is thick, and the usual foramina for the exit of the nerves, at the back and lower part of the orbit, are exceptionally small and thoroughly individualized. (Fig. 1, Plate XXVIII.) In any of these wild Geese, so far as I have examined the skulls of them, if any vacuities exist in the mesial or posterior orbital walls, they occur in the upper or the posterior one, or both, and thus lead into the cranial cavity. This is the case in *Chen*, *Anser*, and *Branta* among the *Anserinæ*, also in *Hymenolæmus* among the *Merganettinæ*, and others.

The *infra-orbital* or *zygomatic bar* is a straight, slender rod in the skulls of all the species of Geese thus far referred to, including *Cereopsis*, as will be appreciated by a glance at figs. 1, 3, 4, and others shown on the plates. Anteriorly, it thoroughly fuses at its articulation with the several bones it meets, as the palatine, maxillo-palatine, nasal, and premaxillary.

Seen upon side view, the great spongy, osseous *maxillo-palatine* in *Cereopsis novæ-hollandiæ* rises above its articulation with the bones below, to articulate with the posterior border of the nasal, with the lacrymal, and, to some extent, with the premaxillary, thus quite shutting out from sight, on this view, the fellow of the opposite side, as well as any of the structures in the posterior part of the rhinal space. To a lesser extent this is likewise the case in *Branta canadensis*; but in this typical wild Goose the ascending plate of the *maxillo-palatine* is thin, and its spongy formation is not overlain with compact osseous tissue, as it is in *Cereopsis*. As a rule, it does not meet the lacrymal, but extensively fuses with the opposite maxillo-palatine, with the posterior border of the nasal, and with the upper surface of the palatine of the same side, thus forming the typical desmognathous arrangement which is characteristic of all the true *Anseres*. With respect to this arrangement, *Branta c. hutchinsi* agrees with *B. canadensis*, as do likewise representatives of the genera *Chen* and *Anser*. It is different, however, in *Tachyeres cinereus*, where it is situated low down, being concave internally, correspondingly convex externally, and thoroughly fused with the mesial surface of the nasal and the inner border of the palatine; and, while it comes extensively in contact with the maxillo-palatine of the opposite side, the suture generally remains ununited. The distal end of the vomer may or may not reach these maxillo-palatines in the middle line—generally not. So low down are the maxillo-palatines placed in the skull of this Duck of the Falklands that an extensive open space is left above them, admitting of a considerable view, from side to side, through the skull, above the vomer and below the fronto-lacrymal roof. (Fig. 23, Pl. XXXII.) In all this, *Hymenolæmus malacorhynchus* among the *Merganettinæ* essentially agrees, as will be seen by comparing the skull of that bird with others shown in the plates (figs. 3 and 23, &c.)

Wild Geese, of various genera, usually have the distal end of the *vomer* either firmly clasped by the united maxillo-palatines or else completely fused with them. As a rule, the upper border of the vomer is produced anteriorly as a delicate little spine, and it is this spine alone that sometimes is the part thus fixed. Occasionally, however, the distal end of the vomer is free, as it is in a skull of a *Chloëphaga hybrida* at hand (No. 1,820, Coll. U.S. Nat. Mus.); but this is by no means commonly the case.

Turning next to the basal view of the skull in *Cereopsis*, we are to note that the *basitemporal area* is unusually smooth, and devoid of any striking elevations or depressions. Anteriorly, at its termination, the openings to the Eustachian tubes are in plain sight, being unprotected by the usual underlying lip of bone, developed at the anterior apex of the basitemporal. What is more remarkable, the basitemporal in the skull at hand develops a thin sheath of bone, which spreads out over the basisphenoid, to extend forwards as far as the anterior endings of the facets for the pterygoids, between which latter, posteriorly, the aforesaid sheath is perforated by an elliptical foramen of some size, with its major axis in the median line. Such a formation has never been observed by me before in the skull of any bird. It is not repeated in any of the *Anatidæ* now under consideration.

In all anserine fowls the *quadrate* is a large and massive bone, and to this *Cereopsis* forms no exception. Upon either one, the two articular facets for articulation with the mandible are elongo-ellipsoidal in contour, with their major axes in line with the longitudinal axis of the pterygoid of the same side. Posterior to these two facets, the quadrate extends well posteriorly; and on the outer side of this extension we find the little cup-like depression for articulation with the hemispherical facet on the mesial aspect of the proximal end of the quadrato-jugal part of the zygoma. When articulated, as in life, this posterior extension of the quadrate in *Cereopsis* comes in contact with the antero-inferior angle of the external border of the tympanic ring, and to all appearances there is something after the order of a pseudo-articulation at that point (No. 19,711, Coll. U.S. Nat. Mus.) This does not obtain in any other wild Goose examined by me. The orbital process of the quadrate is well developed, being a strong, pointed apophysis, and directed, when the bone is articulated, upwards, forwards, and inwards. As to the *mastoid head* of the bone, I have not been able to examine it, as its ligaments hold it firmly in place in the skull at hand, which is not mine. However, this head of the bone is probably double—that is, there are, perhaps, two facets for articulation with the squamosal, with a well-marked lineal depression separating them. This is the case in most *Anseres*, and in the quadrates of all the various species of wild Geese examined by me. Of these two facets, the internal one is the larger (*Chen*, *Branta*, *Anser*).

In *Chen hyperboreus*, on the mesial aspect of the quadrate, below the internal mastoidal head, there is a large pneumatic

foramen, and I believe that air gains thorough access to the bone under consideration in *Cereopsis*, as well as to the major portion of the rest of its skull, including the lower mandible. Hemispherical in form, the facet for the pterygoid of the same side occupies its usual site—that is, just above the mesial mandibular condyle.

Throughout the *Anserinæ* the general character of the quadrate is the same, and in this it closely agrees with the bone as we find it in many of the *Anatinæ* and *Fuligininæ*.

Cereopsis possesses a pair of *pterygoid bones*, fashioned pretty much as we find them in the *Anseres* generally. Either one of them presents an enlarged anterior end, with a much smaller hinder extremity, the latter bearing the cup-like facet for articulation with the quadrate. Between these two extremities the shaft of the bone is somewhat slender, and twisted upon itself. Its three borders are inclined to be sharp, and the distal end of the bone is laterally compressed—the interior one passing the entire length of it between the articular ends. On its upper side, distally, there is a large, elongate, sub-elliptical facet for articulation with a similar one on the rostrum of the presphenoid. The major axis of each of these articular facets is placed, for the most part, longitudinally, though, were the imaginary lines produced, they would intersect at a point about where the vomer terminates posteriorly.

At its anterior end, the *pterygoid* articulates with the hinder extremity of the palatine of the corresponding side. This articulation is a pseudo-enarthrosial one—the pterygoid furnishing the “cup” and the palatine the “ball”; while, above the former, the lip of the pterygoid is produced as a process, as is likewise the lip below. Of these two labia the superior one is always the longer, and here in *Cereopsis* closely fits into a snug depression intended for it, on the supero-posterior end of the palatine. This is an unusual arrangement, for this superior-distal process of the pterygoid commonly forms an arthrodial articulation with the palatine, gliding upon that part of its surface with which it is in contact. This upper process of the distal end of the pterygoid is very long in *Tachyeres cinereus*, but short in *Branta* and in some other Geese.

The morphology of a *palatine* bone in the skull of *Cereopsis novæ-hollandiæ* is well shown in fig. 19 of Pl. XXXI. of the present paper. Anteriorly, in the case of either of them, the extremity is broad and flat, and considerably compressed from above downward. This is placed in the horizontal plane, and a wide interval exists between the two bones. Anteriorly, this is filled in by the fused maxillo-palatines: while, externally, the corresponding maxillary is wedged in—the whole being fused together, and, with the premaxillary and nasals, forming one co-ossified structure.

Each palatine, for its distal moiety, sends toward the mesial line a broad, curved surface. This is thin, being convex above and correspondingly concave on its basal aspect. Each meets the

vomer in the middle line, and at this place of meeting, beneath the presphenoid, they articulate with each other. More posteriorly they diverge, to meet and articulate with either pterygoid bone. On the under surface of a palatine there is a distinct ridge formed, commencing at the pterygoid articulation, to be carried forwards as the mesial edge of the bone, to the point where it comes in contact with the maxillo-palatine of the same side. The intero-anterior palatine vacuity, divided mesially by the vomer, is oval in outline and very broad in *Cereopsis* (fig. 19). It is continuous above with the spacious rhinal chamber of this Australian Goose.

Tachyeres cinereus has its *palatines* straighter, narrower, and placed nearer together than in *Cereopsis*. It also has that which the latter has not—a large pneumatic foramen on the outer aspect of the bone. In both of these birds the postero-external angle of the palatine is slightly produced—that is, not rounded, as we find it to be in *Chloëphaga hybrida*, and perhaps in other species. In *Tachyeres*, again, the palatines—from where they meet superiorly behind, where they clasp the vomer—each sends forward a process that moulds itself upon and contributes to the superior rounded and projecting border of the vomer. This appears also to be the case in *Cereopsis*, in which species the *vomer* is a weak and imperfectly ossified bone, the antero-superior apex of which fuses with the maxillo-palatines in the median plane.

Tachyeres, among the *Fuliginæ*, has a big, deep vomer, convex above and straight below, with its supero-anterior *free* end carried forwards as a sharp spine.

Chloëphaga poliocephala also has a large vomer, while it is free anteriorly and poorly ossified in the skull I have at hand of *C. hybrida*. In the American Geese of the genera *Chen*, *Anser*, and *Branta*, it is fairly well developed—especially in *B. canadensis*.

The *mesethmoid* in *Cereopsis* is almost hidden from view by the bones on either side surrounding it; but its abutment above, beneath the cranio-facial region, is not extensive, while it is particularly so in *Chloëphaga* and *Tachyeres*, where, owing to the formation of the surrounding bones in the dried skull, one may appreciate its entire extent, and observe the broad table it affords for the frontals, nasals, and premaxillary processes to rest upon.

In all the Geese named above, the mesial anterior border of the mesethmoid is sharp, it being short from above downwards in *Branta*, where, at its lowest point, a sharp spine protrudes forwards. This last is furnished by the anterior apex of the *presphenoid*, all this part of the cranium having become thoroughly fused together in the adult.

In the skull of *Cereopsis novæ-hollandiæ* at hand the *ossicles of the middle ear* have remained intact, and it is to be noted that the *medio-stapedial element* is performed in bone, it having the usual form, and the shaft rather long. The *supra-stapedial*, *extra-stapedial*, and the *infra-stapedial*, all being in cartilage, present the usual avian characters for this group of birds, and, morpho-

logically, they differ but little throughout the *Anseres* in so far as I have examined them (*Chen*, *Branta*, &c.)

For a bird of its size, the *sclerotal plates* of the sclerotal circlet or ring, in either eye, are both small and few in number in *Cereopsis*. With the form usually observed for them, they number, in either eye, from 12 to 15, and are particularly narrow between their inner and outer peripheries, in that part of the ring which is situated anteriorly, the eyeball being lodged in the orbit as in life. Without making a very minute study of them, the sclerotals of the eyes of other Geese do not seem to be in any way markedly different from those of *Cereopsis*; they each have the usual quadrilateral form, with the angles slightly rounded off. The posterior ones approach the square in outline, and the anterior ones the parallelogram.

The *mandible* in *Cereopsis novæ-hollandiæ* is quite different, in some respects, from that bone as we find it in *Anser*, *Chen*, or *Branta*. It is likewise very unlike the lower jaw of such a species as *Tachyeres cinereus* among the fuliginine Ducks, though we begin to see its characters faintly reproduced in the mandible of *Chloëphaga hybrida*, and very decidedly so in the mandible of *Chloëphaga poliocephala*. As a matter of fact, apart from the question of size (the bone being one-third larger in *Cereopsis*), the bones in these two Geese possess identically the same characters.

Viewed from above, the mandible is seen to have a somewhat broad U-shaped outline, and is comparatively much shorter, everything else being equal, than the mandible in other kinds of Geese. For example, in *Chen hyperboreus* it is seen to be of the long, somewhat narrow V-shaped pattern, with the dentary portion very thick, its upper border longitudinally concave, and correspondingly convex below. In either of these Geese the symphysis is of fair depth, being convex inferiorly and concave superiorly, and marked with the usual groups of nutrient foramina. On the upper side these always appear to be confined mostly to a double row, just within the anterior symphyseal margin.

The dentary portion of the mandible in *Cereopsis* is low, not very thick from side to side, and externally lacks the deep and curved groove found on the mandible in this locality in *Chen*, *Anser*, *Branta*, and other Geese. We only find in this place in *Cereopsis*, about half-way between the symphysis and ramus, an elongate nutrient foramen, or the opening may be for a nerve exit. (This is well seen in fig. 1, Plate XXVIII.)

The ramal portion of the mandible in *Cereopsis* is not much loftier than the dentary part, while it is notably thin from side to side. In *Chen* and *Anser* this ramal part is conspicuously high, with a sharp, straight, superior border, the latter being rounded below, and continuous with the inferior rounded dentary border and that of the angular process which projects posteriorly. About the middle of the ramal side, externally, and above the mid-longitudinal line, opposite the point where the high part of the

ramus begins to slope to the articular facet of the same side, there is found, on the jaws of all Geese, a more or less prominent process for muscular attachment. It is rather feebly produced in *Cereopsis*, but very strong, prominent, and directed upwards and backwards in such a Goose as *Chen hyperboreus* and its allies.

The mesial aspect of the mandible in *Cereopsis* and most anserine fowls is smooth and flat, presenting no special points for description.

On the upper side of either articular end we note the two facets for articulation with the quadrate; the usual slender *external angular* process directed inwards and upwards, and, finally, the long, very gently upward-curved *posterior articular process*. Mesially, in the recess between these two processes we find a small nutrient foramen in the mandible, on either side, in *Cereopsis*, which opening is of great size in some of the large fuliguline Ducks, as, for example, in *Tachyeres cinereus*; rather less in some Geese, as in *Branta*, and still smaller in others.

Tachyeres, in contradistinction to the *Anserinæ*, has also the posterior articular process on either side, very long, of a parallelogramic outline, with the supero-posterior angle abruptly produced upwards as a triangular process. (Fig. 23, Plate XXXII.) All the true Geese before me at this writing have the long, slender, gently curved, sabre-shaped posterior articular processes—so different from what we find in the form of that apophysis in *Tachyeres*.

A number of years ago I made a drawing for Dr. Elliott Coues of the *hyoid bones* of *Branta canadensis*, seen on dorsal view, which he published in the fifth edition of his "Key to North American Birds" (fig. 72, p. 173). This same drawing I reproduced in my "Osteology of Birds," published in 1909 by the State Museum of Albany. (Fig. 42, p. 314.) As I have no drawings of the *hyoidean apparatus* as found in Geese to present with this paper, I mention these facts, in that a reliable figure of the tongue-bones of a Goose will be at hand for comparison by those who may have either of the above works available, with the description which here follows

As in the case of all Geese, *Cereopsis novæ-hollandiæ* has the skeletal parts of the lingual apparatus perfectly developed, and in no way especially differing from those structures as we find them in a number of its congeners.

The *glosso-hyal*, with its anterior tip finished off with cartilage, is barely half the length of that bone of the arc as we find it in *Branta canadensis*, and of a different form. This last-named bird has a *glosso-hyal* measuring 3 centimetres in length, with an average width of 6 millimetres, all the angles being rounded off. It is concave dorsally, and correspondingly convex below. The cartilage that finishes off its distal end is of about three-fourths the width of the bones itself, while at the proximal extremity the facet for the basibranchial is very large, as compared with that part of this articulation in other Geese.

In *Cereopsis* the glosso-hyal is *triangular* in form, with the apex at the anterior tip, where it is completed with a mere nib of cartilage. Its mid-longitudinal line measures but 15.5 mm., and its greatest width posteriorly, where the lateral angles are somewhat produced, 7.5 mm.

As in *Branta*, the *first* and *second basibranchials* are fused into one piece—the first being of a trapezoidal form and the latter a mere spike extending it posteriorly. Anteriorly, it presents an upper and lower lip, forming an articulation for the glosso-hyal in front of it. From either side of this bone of the hyoid arches, at a point where the basibranchials have co-ossified together, there springs a *thyro-hyal*, the facet of articulation looking backwards and outwards. As usual, a *thyro-hyal* is composed of two pieces, the anterior one being the *cerato-branchial*, which is here a nearly straight and slender rodlet of bone, measuring some 37 mm. in length, which is equal to the length of that bone in *Branta canadensis*, only in the latter Goose it is somewhat stouter, more curved, and has a larger head anteriorly. The posterior piece, called the *epi-branchial*, is not more than half as long as the cerato-branchial, and is uniformly curved throughout its length so as to accommodate itself, in life, to the form of the back of the cranium. Either of these *epi-branchials* is concaved for its entire continuity dorsally, and correspondingly convex ventrally, the distal end being tipped with a bit of cartilage. This is also the case with the *uro-hyal* or second basibranchial.

Branta canadensis has an *epi-branchial* likewise curved upward, but the bone is semi-cylindrical in form, and thus differs entirely from what we find in *Cereopsis*.

In *Chen h. nivalis* the glosso-hyal is greatly elongated and very narrow. Judging from the dried and roughed-out specimen at hand (No. 18,611, Coll. U.S. Nat. Mus.), it would appear that, in this species, the large tip of cartilage terminating its distal extremity may ossify, and thus form an *accessory glosso-hyal*. The rest of the apparatus practically agrees with what we find in *Branta*.

Throughout the *Anseres* the bones of the hyoidean apparatus differ, to some extent, for different species and genera; but they are upon the same plan, and generally well developed. I have examined them for a large number of birds of this assemblage, including *Dendrocygna*, *Hymenolæmus*, *Oidemia*, *Olor*, and many of the *Anatinae* and *Fuligulinae*.

So far as I have compared the *hyoidean apparatus* of *Cereopsis novæ-hollandiæ*, I find nothing in its morphology that points to the near kinship of any of the Geese or Ducks I have mentioned. As to *Chloëphaga*, *Tachyeres*, *Coscoroba*, and other important forms, I have no material at hand representing the bones of the *hyoid arches* in them.

There is considerable literature extant upon the ossifications of the *respiratory* and *vocal organs* of the *Anserinae*; but, inasmuch as these were not preserved in the only skeleton I have at hand

of *Cereopsis*, I shall be obliged to omit a description of those parts which ossify in the *larynx*, *trachea*, and *bronchial portions* of the air-passages of this Goose.

ON THE REMAINDER OF THE AXIAL SKELETON IN CEREOPSIS
NOVÆ-HOLLANDIÆ.

The Vertebral Column.—Most Geese agree very closely in the number of vertebræ any species may possess in its spinal column. *Branta canadensis*, *Chen hyperboreus*, and the Goose now under consideration all have 18 vertebræ in the cervical division of the spine that are without free ribs. These are followed by the nineteenth and twentieth, each of which has a pair of free ribs, but they do not reach the sternum. From the twenty-first to the twenty-fourth, inclusive, they are true dorsals; while in *Cereopsis* and *Branta*, from the twenty-fifth to the forty-third, inclusive, are sacral vertebræ co-ossified with the pelvis. In the case of *Chen* the sacrum only includes the forty-first. Not including the *pygostyle*, the vertebræ in the tail of *Cereopsis* are from the forty-fourth to the forty-eighth inclusive; in *Branta*, from the forty-fourth to the forty-ninth inclusive; and in *Chen*, from the forty-second to the forty-seventh inclusive. In all this *Anser albifrons* agrees, with the exception that, in that Goose, only the nineteenth vertebra possesses a pair of free ribs which do not connect, through hæmapophyses, with the sternum.

Atlas vertebra has an antero-posteriorly broad neural arch, which is smooth dorsally and unsurmounted by any neural spine, while a rudimentary hæmal process is found, mesially, on the arch below the atlantal cup for the occipital condyle. Laterally, the *vertebral canals* are closed in to the outer side, in either case, by a mere slender span of bone of hair-like calibre. These last are somewhat stouter in the *axis vertebra*, which has a large quadrate hæmal spine, and a low, thick neural one, situated far back on the still thicker neural arch.

After passing the axis, a neural spine is found upon the third cervical to the ninth, inclusive, it being, up to include the eighth, a long, low lamina of bone, with a smooth convex superior margin.

On the ninth vertebra it occupies a middle place on the centrum, and is much shorter antero-posteriorly, but has the same convex superior border. In the *tenth cervical* there is a low, rudimentary neural spine, which, in the eleventh, twelfth, and thirteenth, has almost disappeared. In the fourteenth, fifteenth, and sixteenth it is antero-posteriorly notched, giving the process a bifid appearance. In the seventeenth, and still more in the eighteenth, it assumes the quadrate form of the neural spine in the dorsal series of vertebræ.

Pre- and post-zygapophyses in the third and fourth cervicals are joined by hair-like spans of bone; but in the fifth they have disappeared all to their endings.

There is a long, low hæmal spine on the third cervical, which is rudimentary in the fourth, and makes way for the ending of the

carotid canal in the fifth. This latter extends to include the fifteenth cervical, being broad and open in the anterior part of its course, to become narrower and more enclosed as we pass backward. At the sides of the cervicals the pleurapophyses are long, and terminate with a well-marked process on either side, posteriorly; they assist in most effectually closing in the long *vertebral canals*. In the seventeenth vertebra they assume the form of a rudimentary *rib*; but it is not free, being still fused with the transverse process and centrum of the vertebra on either side. However, in the eighteenth vertebra their places are taken by a pair of long, free ribs that support "epipleural appendages."

It may be remarked here that, with the exception of the atlas, the entire skeleton of the trunk in *Cereopsis novæ-hollandiæ* is more or less pneumatic, air being very freely admitted to most all the bone through foramina occupying their usual sites when present.

Throughout the cervico-dorsal region of the spine the neural canal is of a cylindrical form, quite uniform in calibre, being of but moderate capacity.

As in other existing *Anseres*, the cervical vertebræ of *Cereopsis* are all heterocœlous.

In the *dorsal region* of the spinal column of this Goose we find *four* vertebræ, and these, in life, are very intimately articulated with each other. Their *neural spines* are thick, somewhat lofty, and their superior borders are likewise much thickened, being anteriorly and posteriorly extended in order to lock with each other, which is accomplished by the anterior end of each being bluntly pointed to fit into a corresponding notch on the hinder end of the superior border of the neural spine in front of it.

These neural spines are moderately lashed together by the ossification of the tendons of certain muscles of the back. Similar ossifications on the dorsal aspects of the outer ends of the transverse processes of these vertebræ, in conjunction with the metapophyses, tend to still further bind the dorsal vertebræ together. The centra of these vertebræ do not exhibit much lateral compression, and they are pierced here and there by pneumatic foramina of various sizes.

For each pair of ribs the facets are slightly raised, and are to be found far forward on the centrum of each vertebra. The *neural canal* is of considerable calibre, and in the articulated skeleton may be seen into through the circular vacuities formed between each contiguous pair of vertebræ by the articulating of their pre- and post-zygapophyses.

There is a low, lamina-like spine on the first dorsal vertebra, and a more conspicuous one on the second, which is bifid below; but after that these zygapophyses are absent. (Fig. 25, Plate XXXIII.)

Rather broad antero-posteriorly, the *dorso-vertebral ribs*, in the skeleton of *Cereopsis* at hand, are transversely much compressed. Their free borders are sharp, and about at the middle of the posterior one of each there is found an anchylosed *epipleural*

appendage, the distal extremity of any one of which is truncate almost transversely to its long axis. Any one of these dorsal ribs possesses a somewhat enlarged head, a laterally compressed tubercle, and a slightly constricted neck. On the posterior aspect of the latter, between the capitulum and tuberculum, there is, in the first three pairs of these dorso-vertebral ribs, an unusually large and open pneumatic foramen. There are also smaller openings of this kind on the anterior aspect of the necks and elsewhere.

The *hæmapophyses* or *costal ribs* are also highly pneumatic, and these bones are likewise laterally compressed, with increasing lengths as we follow them backward.

While considering the ribs, it will be as well to note that there are two pairs of perfect *sacral ribs*, agreeing in all respects with those of the dorsal series, barring their gradually increased lengths and the lengths of their long costal ribs, each pair of which reach the costal borders of the sternum in a perfect articulation. The latter pair of these two pairs of "dorso-lumbar" ribs do not support uncinæ processes, as do the first pair.

The next following pair of ribs are rudimentary and largely fused, in the matter of their articulation, with the ilia and their vertebræ. Here, both the pleurapophyses and hæmapophyses are long and slender; the latter, on the right side in this skeleton, reaches the sternum to articulate with the ultimate facet on its costal border; while, upon the left side, the hæmapophysis does not reach the costal border of the sternum by 2 or 3 millimetres—that is, it is a "floating costal rib."

There is, posterior to these latter ribs, another rudimentary pair of "sacral ribs" with "floating hæmapophyses," and, posterior to these again, there may be a final rudimentary pair, with or without floating ribs. As to the exact osteology of these latter, I cannot be quite sure, as they are broken off in the skeleton at hand, and a part of another skeleton before me does not include the ribs.

Fig. 25 of Pl. XXXIII. of the present paper exhibits very well the broken and imperfect ultimate ribs in this skeleton (No. 18,571, Coll. U.S. Nat. Mus.), while the "skeleton" of *Cereopsis novæ-hollandiæ* (No. 19,734, Coll. U.S. Nat. Mus., marked "Body") consists of the cervical and dorsal vertebræ complete; the four free caudal vertebræ and pygostyle; the femora; the imperfect hyoid arches; a perfect larynx and the first three or four rings and semi-rings of the trachea.

Branta canadensis and *Anser albifrons* have four pairs of ribs belonging to the dorso-lumbar vertebræ, articulating with them as in *Cereopsis*, beneath the eaves of the ilium upon either side, while *Chen hyperboreus nivalis* possesses but three pairs of them, the last pair being very rudimentary and slender.

The Pelvis and Coccygeal Vertebræ.—Agreeing with a number of other species of existing *Anserinæ*, *Cereopsis* possesses an elongate and comparatively narrow pelvis—indeed, actually as well

relatively speaking, the preacetabular portion of it is longer and somewhat narrower than the same portion in representatives of the genera *Chen*, *Branta*, and *Anser* (fig. 15, Plate XXX., fig. 25, Plate XXXI.), while it more nearly resembles that part of the pelvis in *Olor*, either *buccinator* or *columbianus*. In these Swans, however, the last lumbar vertebra fuses with the first dorso-lumbar, and consequently protrudes beyond the ilia, which it does not do in the case of the Geese.

Such species as *Hymenolæmus malacorhynchus* and *Chenonetta jubata* possess the Duck-like form of pelvis, so comparisons would avail us nothing in this respect with them. (Fig. 5, Plate XXIX., and fig. 26, Plate XXXIV.)

In *Cereopsis*, from the somewhat stunted prepubis to the rounded antero-lateral angle of the ilium, on either side, the rather roughish border is concave inward, while the side of the bone above it is quite uniformly concaved, and faces for the most part outward, having nearly the same depth throughout. For rather more than its middle third, the inner, which at the same time is the superior, border fuses completely with the superior border of the neural spines of the dorso-lumbar vertebræ. Posteriorly, on either side, this border curves outward to bound the post-acetabular area anteriorly. (Fig. 15, Plate XXX.)

Further, we are to note upon this dorsal aspect of the pelvis of this cereopsine Goose that, mesially, in the post-acetabular area, the *sacral vertebræ*, as well as a number of the leading *uro-sacrals*, are most completely fused together and with the ilium on either side. So complete is this co-ossification that but a very few minute vacuities remain between the transverse processes of the vertebræ, and these afford but the barest hint as to the limits of the bones involved in the amalgamation. In the case of the last three uro-sacrals, their transverse processes become more and more distinct or individualized as we proceed backward. The transverse processes of the leading one of these three articulate, in the usual manner, with the ilia; the next following one is much smaller, and its transverse processes do not reach the iliac borders; while the last one, which closely resembles a true caudal vertebra, is grasped by the ilium upon either side—a conspicuous process being thrown out to meet the ends of the transverse processes of the vertebra. This is well shown in fig. 15 of Plate XXX. There is no approach to anything like this in any pelvis of Goose or Swan thus far examined by me.

On lateral view there is to be observed the large, circular *acetabulum*, the inner ring being about one-fourth smaller than the outer. These rings are nearly of equal size in *Branta canadensis*, but showing only slight differences in their diameters in *Olor* and *Chen*. The form of the *antitrochanter* varies but little among the various genera, and the small, elliptical *obturator foramen* below it is better divided from the large, elongate *obturator space* in *Cereopsis* than it is in other Geese, or in the Swans.

From the lower arc of the obturator foramen backward almost

to the point where the postero-inferior angle of the ischium abruptly sends down a broad process to meet it, the *pubic element* is long and slender. At the point defined it is as much as three or four times as broad, but contracts very gradually as it proceeds backward towards its free end, where it moderately expands again to form the dilation there existing. This expansion at the distal free end of either pubic bone in *Branta* and *Olor* is conspicuously large and paddle-shaped, while in *Chen* it is almost as we find it in *Cereopsis*, the only difference being that, in the former, the bone, after passing its articulation with the ischium, is more abruptly curved downward.

In all these genera there is a marked *ischio-iliac notch* on the posterior pelvic border, which in *Branta canadensis* is converted into a foramen by the ilium and ischium meeting behind it again. (No. 17,980, Coll. U.S. Nat. Mus.) Sometimes, in *Chen hyperboreus*, there is a minute foramen anterior to the notch on either side that I have noticed in other pelvises.

In *Chen cærulescens* the ischio-iliac notch is particularly deep in some specimens.

On the dorsal aspect of the pelvis, mesially, between the acetabula, backward to a point about opposite the posterior endings of the ischio-iliac foramina in *Olor* and *Branta*, the entire area is much concaved, being deepest in the median line, and rolling up on either hand above the antitrochanter anteriorly, and the elongate, large ischio-iliac foramen, posteriorly. This region is somewhat concaved in *Cereopsis*, but very much less so in *Chen*, in which latter genus the ilia are conspicuously separated from the uro-sacral vertebræ, which is not the case in *Branta*, and only in the case of the last two vertebræ in *Olor columbianus*.

Viewed ventrally, the pelvis in *Cereopsis* is very narrow and contracted anteriorly, but broader, deep, and capacious after passing the acetabula. This is more or less the case with all these Swans and Geese, though in *Olor columbianus*—a very big bird—the shortest distance between the ischio-iliac foramina measures but 32 mm., while in *Cereopsis*—a much smaller fowl—it measures 40 mm.

In this Cape Barren Goose of Australia the skeleton of the tail is not as well developed as it is in other anserine genera. The four *caudal vertebræ* composing it have short, stumpy neural processes with clubbed extremities, while the transverse processes are short and depressed. Rudimentary, free *chevron bones* are to be found between the last two or three of these vertebræ, being represented merely by twin ossicles resting on the transverse line of the articulation between the centra of contiguous vertebræ. Subquadrilateral in outline, the *pygostyle* is small for the size of the bird, and in keeping with the vertebræ in advance of it. Its upper border is sharp, while the lower one is thickened, longitudinally grooved, and harbours three or four large pneumatic foramina.

This is also the case in *Olor columbianus*, in which bird the

distal end of the pygostyle is somewhat produced—an elongation which, in *Branta canadensis*, is very marked. In this Goose, too, there are six free caudal vertebræ, which in the case of the third, fourth, and fifth have long, deflected transverse processes, and thick (but by no means lofty) neural spines. The fifth vertebra of this series in the skeleton at hand has its transverse process on the right side profoundly bifid, the bifurcations being slender and spreading. Chevron bones occur as in *Cereopsis*. In *Chen* the caudal vertebræ are non-pneumatic, and for size they hold an intermediate place, being somewhat better developed than they are in the Australian species, and not as well as they are in *Branta canadensis*.

The Sternum.—Dorsally, the sternum of *Cereopsis* is profoundly and doubly concave, the two concavities merging into each other in such a gradual manner as to be hardly perceptible. The transverse line approximately dividing them may be considered to pass just a little posterior to the facets on the costal borders for the ultimate pair of hæmapophyses.

Similar double concavities characterize the dorsal aspects of the sternum in *Branta* and in *Chen*, and doubtless in other Geese, the anterior one being for the thoracic organs and the posterior for a part of the abdominal ones.

On the *costal borders* the articulations for the *costal ribs* present their usual avian characters as seen in ordinary birds. They are directed backwards, upwards, and outwards—very much outwards in the case of *Chen hyperboreus*, and even more so in *Branta canadensis*.

Posteriorly, the xiphoidal part of the bone presents two profound “notches,” being elliptical in outline.

The lateral xiphoidal processes thus formed are long and nearly of equal width throughout, averaging about 7 mm., while the median xiphoidal process is wide, its hinder border being sharp and transverse. It has an average width of about 3 centimetres.

In *Branta canadensis* the notches are more broadly elliptical in outline; the lateral xiphoidal processes relatively longer, with their ends, posteriorly, somewhat expanded; while the postero-external angles of the mid-xiphoidal process are laterally considerably produced. This is also the case in *Chen hyperboreus nivalis*, but not so much so.

Anteriorly, the border of the sternum in *Cereopsis* is much thickened, convexed forwards, with its face in front being modelled to form the articulations for the coracoids; and when these latter are articulated as in life, they do not meet mesially, the contracted interval being a small, rather shallow pit. This is also the case in *Branta*; while in *Chen* the coracoids come in contact in the median line.

In all these Geese the *costal processes* are quadrilateral in outline, rather large but not lofty, while below either one of them, at the outer ending of the coracoidal groove, there is another sharp process developed—an osseous, broadly triangular lip, which

serves to keep the coracoid of either side safe in its articulation.

There is no *manubrium* on the sternum of the Cape Barren Goose, while quite a prominent one is found in *Branta*, which is short and peg-like in *Chen*.

Immediately over the anterior border, in the median line posteriorly, there is always present a circumscribed, rather deep and sizable concavity, the base of which is perforated with a numerous group of small foraminal openings for the admission of air into a large part of the anterior portion of the sternum.

On either side of this median pit, occurring as it does on both *Chen* and *Branta*, there are collections of small pneumatic foramina, extending around as far as the base of either costal process. These do not exist in the sternum of *Cereopsis*, where all this part of the sternum is smooth and unbroken, not having the thickened posterior rim so prominent in *Branta canadensis*, and nearly as much so in *Chen hyperboreus* and *C. caerulescens*.

In *Olor columbianus* and other Swans this is quite different, there being no median pneumatic concavity just over the anterior border; while in place of it there is an elevation of some size, its middle part being thickened, and extends up to merge with the anterior border in the median line. As a matter of fact, the sternum of a Swan is so unlike that bone in *Cereopsis* in so many particulars that a comparison would avail us nothing beyond a demonstration of the decided osteological differences existing between an average Goose and one of the *Cygninæ* in this part of their skeletons.

The sternal carina in *Cereopsis* is ample and deep anteriorly, while it slopes away gradually as we proceed backward, to be finally lost on the mid-xiphoidal process at a distance of some 2 centimetres from its hinder border. Anteriorly, the border of this keel is thickened and concaved, more so than in either *Chen* or *Branta*. Likewise, the lower border of this keel is thick and smooth, being evenly convex outward from the carinal angle in front to where it is lost on the surface of the bone posteriorly. (Fig. 25, Plate XXXIII.)

The ventral surface of the sternal body is smooth and convex, presenting for examination but the single muscular line on either side of the carina, extending from the middle point of the coracoidal groove, backward, to be lost on the surface of the bone between the "notch" and the termination of the keel. This muscular line is very strong and elevated in *Branta*, and more or less in all the *Anserinæ*. It is the boundary-line between the three pectoral muscles of the breast ("Myology of the Raven," p. 71, fig. 25).

A similar "muscular line" traverses either side of the keel, running from a point on the anterior border, at the junction of its middle and lower thirds, to be lost on the surface of the bone, near the end of the carina, in *Cereopsis*; but in *Branta canadensis* distinctly joining the termination of the line (in a rounded curve)

described above as passing down the ventral aspect of the bone. This line is also a boundary one between pectoral muscles, and is present on the keel of the sternum in most ordinary birds.

The Pectoral Arch or Shoulder-Girdle.—All the bones composing this arch in the skeleton of the Goose now being considered are, in the highest degree, pneumatic. In the *scapulæ* the foramen is found on its dorsal aspect, in the middle line, close to its coracoidal articulation. In the *coracoids*, a group of these foramina is found on the mesial aspect of the superior end of the bone, under the eaves of the overarching head; and in the *os furcula*, on the outer side of the free clavicular extremity at its broadest part. It will be noted from this that when the bones of the girdle are articulated, as in life, their pneumatic foramina are all in the neighbourhood of each other and directed toward the *foramen triosseum*.

When duly articulated, the *scapulæ* reach almost as far back as the pelvis, either one of these bones being thick and flatly rounded anteriorly; bluntly pointed at the distal apex; arched throughout in that it may conform to the skeletal wall of the thorax; while the head, anteriorly, articulates with both coracoid and furcula in a manner common to the *Anseres* generally. With the coracoid of the same side it helps form a commodious glenoid cavity, the boundaries of which, front and back, are thickened and raised.

The *coracoids* are big bones in every particular, as they are in all species of wild Geese. Their sternal extremities are very much expanded and flattened antero-posteriorly. As usual, the lower outer angle extends backward as a fairly prominent process, though more so than it is in *Olor* or *Branta*. As all the superior parts of the bone are of large proportions, the shaft between these and the expanded lower end is so much shortened thereby that it has the appearance of being but little more than an intervening "neck," which is a condition that by no means exists in all *Anseres* where the coracoidal shaft is much longer.

The *os furculum* is of the broad, U-shaped pattern, and is entirely without a hypocleidium. In structure it is rather stout, with either, somewhat enlarged, clavicular extremity drawn out into a long, rather sharp, end, which in life, or in the duly articulated skeleton, glides over the antero-mesial surface of the scapula on either side.

At the arch below, the posterior surface is roundly convex; but this becomes flat as we proceed toward the clavicular ends. In front the arch is also flat, with a very slight inclination to become concave from side to side.

In the articulated skeleton this latter surface faces mostly upwards, and is lost on the smooth, flat limb of either clavicle higher up, on their mesial aspects.

There are no *acromial processes* present on this *os furculum* as there are in *Branta canadensis*, to a very slight extent in *Chen*, and are conspicuous characters in so many Ducks and Mergansers.

In *Branta*, the fourchette is non-pneumatic, while in *Olor* it is much modified in its morphology at the lower part of the arch, in order to accommodate the passage of the trachea to and from the tracheal chamber of the sternum in members of that genus.

THE APPENDICULAR SKELETON.

The Pectoral Limb (fig. 22, Plate XXXI.)—In this Goose the skeleton of the wing presents every indication of powerful development, suggesting at once a bird endowed with the maximum capacity of flight.

The *humerus* presents the usual sigmoid curves from proximal to distal end, though in no marked degree. It has an extreme length of about 171 millimetres, and is completely pneumatic, the air gaining access to the interior of the bone through a large elliptical foramen situated, as usual, in the pneumatic fossa on the anconal side of the bone, beneath the eaves of the ulnar tuberosity. The lower boundary of this is extended as a thin, sharp crest or border, which is lost upon the shaft not far from the pneumatic opening (*crista inferior*). *Caput humeri* is large and smooth, being separated from the ulnar tuberosity by a well-marked *incisura capitis*, which gives especial prominence to the *tuberculum internum*.

There is a very conspicuous *radial crest*, which has a somewhat thickened, convex border. It is bent over so far palmar as to be almost perpendicular to the palmar aspect of the shaft, it being extended down the latter to a point about at the junction of the proximal and middle thirds. At its widest part the proximal extremity of the humerus measures about 33 millimetres. The middle third of its shaft is subcylindrical in form, and very smooth.

At the distal extremity we are to note the usual radial and ulnar tubercles for articulation with the bones of the forearm, and proximad to them a fairly well marked depression indicating the site for the insertion of the *brachialis anticus* muscle. Prof. Fürbringer designates this depression as the *fovea supratrochlearis ventralis des Humerus* in the common Goose, and states that the *brachialis inferior muscle* arises there, which statement is also made by Dr. Gadow in Newton's "Dictionary of Birds" (p. 439).

The ectepicondylar process is but feebly pronounced at this distal end of the humerus in *Cereopsis*, and the same may be said for the entepicondylar one on the other side of the bone.

In *Chen hyperboreus* the humerus is somewhat smaller than the bone in this Cape Barren Goose, but the characters are identical.

Passing to the *ulna*, we find it to have a length of some 173 mm., the radius being but a trifle shorter. Down the palmar aspect of the ulnar shaft there is a fairly distinct raised line, slightly broken at nearly regular intervals by minute elevations, averaging some 11 mm. apart. This line is quite straight, and indicates where the quill-butts of the secondary feathers are inserted in life. Proximally, the head of the ulna is very large, and the big shaft

immediately beyond it is trihedral on section. For the rest, it is nearly cylindrical, while its distal end presents the usual characters of the bone as seen in the *Anseres* generally.

The shaft of the *radius* is but slightly double-bowed, and has a calibre of about one-third of that of the ulna.

At the *carpus* we find the two usual carpals—the *radiale* and the *ulnare*—each presenting the ordinary ornithic characters.

Carpo-metacarpus has an extreme length of some 97 mm. Its main shaft (index metacarpal) is straight, subcylindrical, and short, while that of the third metacarpal is but slightly bowed. The *proximal phalanx* of index metacarpal is elongate and rather narrow, with its posterior expanded portion smooth on both aspects, and never exhibits any vacuities. Other *phalanges* present nothing worthy of special note beyond the fact that there is a claw on both the *pollex digit* as well as upon the distal phalanx of index. The former is not shown in fig. 22 of Pl. XXXI., as it had been lost from the skeleton. It is, however, present on this digit in the right limb.

Chen hyperboreus has the tubercles for the quill-butts of the secondary feathers on the shaft of ulna much more prominent than in *Cereopsis*, and they are found in a row above a line corresponding to the one described above as found on the ulna of the Australian Goose. Otherwise, apart from the matter of size, the bones are quite in agreement with respect to characters, and the same is practically true with respect to the bones of manus on these two anserine fowls.

The Pelvic Limb (fig. 24, Pl. XXXII.)—Differing in some few minor details from the *femur* of either *Branta* or *Chen*, this bone in *Cereopsis* agrees with both of them in being notably stout and strong. In the Goose here being considered, its extremities are bulky and big, and the shortest cylindrical shaft is straight. The femoral head is about sessile with the upper part of the shaft, there really being no neck connecting the two. Its pit for the insertion of the ligamentum teres is very shallow and diffuse. Both caput femoris and the summit of the shaft are in the same plane, while the massive trochanter major, with its superior and circular limiting line, barely rises above the same.

On its external aspect the trochanter major has great transverse width, while the trochanter minor can hardly be defined.

At the distal extremity anteriorly the intercondylar space is very wide, and the surface markedly concaved. The superior ending of the internal condyle does not merge gradually upon the shaft, as does the external one, but presents a characteristic shoulder before doing so. This character is barely noticeable in *Branta* or in *Chen*.

Posteriorly, the *popliteal fossa* is deep, and situated entirely above the internal condyle, which latter is very broad and rounded.

All the usual tubercles and depressions for muscular and ligamentous attachments seen in femora of birds generally are here

present at their usual sites, and the *linea aspera* is well marked down the shaft.

None of the bones of this limb is pneumatic, and this is the case with all Geese which I have examined with the view of ascertaining this point.

As a rule, in the *Anseres* the *patella* does not ossify, though occasionally in some species the cartilage of which it is formed becomes very firm and dense—so much so that in dried skeletons the track or groove of the ambiens muscle is plainly to be seen crossing it obliquely. There does not seem to be an osseous patella in the Goose here being described, nor in any of its congeners.

Measuring from the highest point on the entocnemial process of the *tibio-tarsus* to the lowest one on its internal condyle, this bone has an extreme length of 163 millimetres.

The shaft is straight, and for the most part more or less cylindrical. To meet the requirements for articulation with the femur the area of its summit is more than usually extensive—that is to say, in order to provide the requisite room for the concavities to accommodate the femoral condyles. Above this summit rears the cnemial process, divided, as it is in nearly all existing birds, into the ento- and ectocnemial crests. The first of these is the longer, and placed the higher on the shaft. It projects directly to the front, while the somewhat smaller, broadly-hooked one turns directly outward so that it is in a plane at right angles to the first, and when the articular skeleton of the limb is viewed directly from in front completely hides the head of the fibula.

On the outer side of the shaft of the *tibio-tarsus*, rather more than a centimetre below its summit, there is the *fibular ridge*—an individualized, low crest, 3 centimetres long, the entire length of the free outer border of which articulates with the fibula.

At the distal extremity the condyles are large and uniform in outline. Anteriorly, they protrude considerably, and are rather broad and rounded; while, posteriorly, they are reduced to sharp, low ridges, with a much shallower intercondylar space as compared with the deep and broad one in front. Above the latter there is the usual tendinal canal, which fades away on the anterior aspect of the shaft at about the junction of lower and middle thirds. Just above the condyles on this view we find the usual osseous span across this tendinal groove, and on either hand the usual tuberosities for the insertion of the tendons of certain muscles of the thigh.

This *tibio-tarsus* of *Cereopsis* is identical in character with that bone as we find it in *Branta canadensis* (No. 17,980, Coll. U.S. Nat. Mus.), even to the matter of length, it being in the Canada Goose only 2 or 3 millimetres shorter.

Practically, this also applies to the *fibula*, though in *Branta* the tubercles and grooves on the outer aspect of its head are more pronounced. In both birds, however, the fibula is much com-

pressed from side to side, tapers gradually, though rather smartly, to the end of the "fibular ridge" upon which it articulates with the tibio-tarsus, after which it becomes very small and slender, and co-ossifies with the side of its companion-bone of the leg, at the commencement of its lower third.

The characters, as above described, of these two bones of the pelvic limb are repeated with but slight differences in the corresponding ones of *Chen hyperboreus nivalis*, and probably other anserines.

With an extreme length of 104 millimetres, the *tarso-metatarsus* of this Cape Barren Goose is proportionately as strong and as straight as the other long bones of this limb.

At its summit, the depressions to receive the articulation of the condyles of the tibio-tarsus are deep and well separated, and especially by the prominent intercondylar tubercle, which, as a rounded elevation, surmounts, at the middle line, the anterior border just above the deep concavity at the head of the shaft of the bone on that aspect.

At the base of this concavity are to be noted the two small foramina, placed side by side, which pass antero-posteriorly through the bone—one to emerge on the internal face of the hypotarsus, and the other passing through it. Below these, anteriorly, we are to observe the small parallel elongate tubercles for the insertion of the tendon of the *tibialis anticus muscle* ("Myology of the Raven," p. 201, fig. 55).

As to the shaft, it is for the most part flat and smooth in front—that is, below the longitudinal groove traversing its upper half, which latter shades away at its middle third. Distally, it is expanded on account of the trochleæ.

Posteriorly, we have above, at its distal end, the *hypotarsus*, which is here very broad, rather deep anteriorly, more particularly so on the mesial side where its hinder border is extended clear down the entire length of the posterior aspect of the shaft, almost to the inner trochlea. There are two other such "guides" to the tendons, which, as fine raised lines, run down the back of the shaft of this bone.

Smooth and flat on its inner aspect, we are to note further, in regard to the hypotarsus, that it has three longitudinal canals for the passage of tendons on their way to the toes. External to these canals, there is still another open groove, also for the accommodation of a tendon. Probably the aforesaid canals do not seal over with osseous tissue until the individual has fully matured with respect to such changes. Prior to that time, these canals are, posteriorly, backed only with fibrous tissue, which is what ossifies later on in life.

Branta has a tarso-metatarsus similar to that bone in *Cereopsis*, but the tendinal groove to the outer side of the hypotarsus is not quite as well defined.

As to the posterior exits of the two foramina that perforate the upper extremity of the shaft, one is found in plain sight at the

middle of the base of the hypotarsus on its mesial side; the other occurs at the distal ending of the first canal on the outer side. This is also the case in other Geese, as *Branta* and *Chen*, while in the representatives of the latter genus there are but two grooves, and two closed canals traversing the hypotarsus.

Mid-trochlea is very large, and situated much lower on the shaft than is the one on either side of it. Each is markedly individualized, and the foramen for the anterior tibial artery is of considerable size, occupying its usual site. It communicates with another perforation—a much smaller one—which passes longitudinally through the isthmus below it, connecting the middle and outer trochleæ. This secondary foramen is also present in this locality in *Chen* and *Branta*, and perhaps in other *Anserinæ*.

First metatarsal is free and rather small in this Australian Goose, and the toe it supports with its claw or ungual joint is somewhat feebly developed. On the other hand, the three *anterior toes of pes*, with their 3, 4, and 5 joints, taken in their order from the inner to the outer one, are stout and short, as we would expect to be the case in a bird that spends so much of its time upon the ground.

The ungual joints are big, sharp-pointed, and considerably curved. At their proximal extremities the three basal joints are somewhat massive, while each one, palmar, has its basal moiety deeply grooved in the longitudinal direction for the accommodation of certain plantar tendons.

The proportional lengths of these pedal joints are well shown in fig. 24 of Plate XXXII. of the present contribution.

There appear to be no *sesamoid bones* at the interarticulations of the joints of the toes in the sole of the foot of this Goose, such as we find in some birds which by habit are largely terrestrial, or spend considerable of their time upon the ground.

ON THE AFFINITIES OF CEREOPSIS NOVÆ-HOLLANDIÆ.

Apart from the skull, the remainder of the osteology of this Goose presents nothing to indicate that it is an *anserine outlier* among the *Anseres*. As a matter of fact, many of the characters of its trunk skeleton—and more especially is this the case with respect to the appendicular skeleton—are practically in agreement with the corresponding one in the skeletons of such typical Geese as we have in *Anser*, *Branta*, and *Chen*.

As to the skull, in some particulars, as have been set forth above, it exhibits a number of very marked differences as compared with that part of the skeleton in such genera of Geese as have just been mentioned in the last paragraph. Nevertheless, this skull is withal anserine in its characters, though indicative of belonging to a somewhat aberrant type.

Further, its osteological characters point to the fact that it belongs to a sub-family—the *Cereopsinæ*—distinct from the sub-family *Anserinæ*, and is more nearly related to *Chen hyper-*



boreus of the latter than it is to any other species of existing Goose. Possibly, among extinct forms it may have had congeners—and probably did—to which it was more nearly affined than it is to the species just mentioned, but of this I have no knowledge at present.

The opportunity to compare it, osteologically, with the remains of the extinct *Cnemidornis* and *Centronis*—and especially the first-named genus, of which the fossil remains of several species have been found in New Zealand (Pleistocene)—has not been my good fortune up to the present.

Taking *Cereopsis* into consideration, my views at present upon the taxonomy of the *Anseres* may be set forth as follows:—

| SUB-ORDER. | FAMILIES. | SUB-FAMILIES. |
|------------|---------------------------------------|--------------------|
| Anseres. | Anatidæ | 1. Cygningæ |
| | | 2. Anseranatinae |
| | | 3. Plectropterinae |
| | | 4. Cereopsinae |
| | | 5. Anserinae |
| | | 6. Dendrocygningæ |
| | | 7. Chenonettinae |
| | | 8. Anatinae |
| | | 9. Fuligulinae |
| | | 10. Erismaturinae |
| | | 11. Merganettinae |
| | Gastornithidæ (extinct ; provisional) | 12. Merginae |
| | | Not determined. |

Recently, I have completed a contribution on the genus *Dendrocygna*, examining the members of the entire genus and two species osteologically. My examination of them has led me to believe that they represent a distinct sub-family of themselves, and this sub-family I have duly characterized in the aforesaid work, which will appear in due course.

EXPLANATION OF PLATES.

(All the plates are from photographs made direct from the specimens by the author.)

PLATE XXVIII.

- Fig. 1.—Right lateral view of the skull of *Cereopsis novæ-hollandiæ* with mandible detached. Very slightly reduced. (No. 19,711, Coll. U.S. Nat. Mus.)
- Fig. 2.—Right lateral view of the skull of *Dendrocygna autumnalis*, ♀, with mandible detached. Very slightly reduced. Collected in Southern Texas by Mr. F. B. Armstrong. Note the complete osseous periphery to the orbit.
- Fig. 3.—Right lateral view of the skull of *Hymenolæmus malacorrhynchus*, ♀ (New Zealand). (No. 19,024, Coll. U.S. Nat. Mus.) Mandible detached. Very slightly reduced.

- Fig. 4.—Right lateral view of the skull and detached mandible of *Chloëphaga poliocephala*, ♀ (Strait of Magellan). (No. 18,202, Coll. U.S. Nat. Mus.)

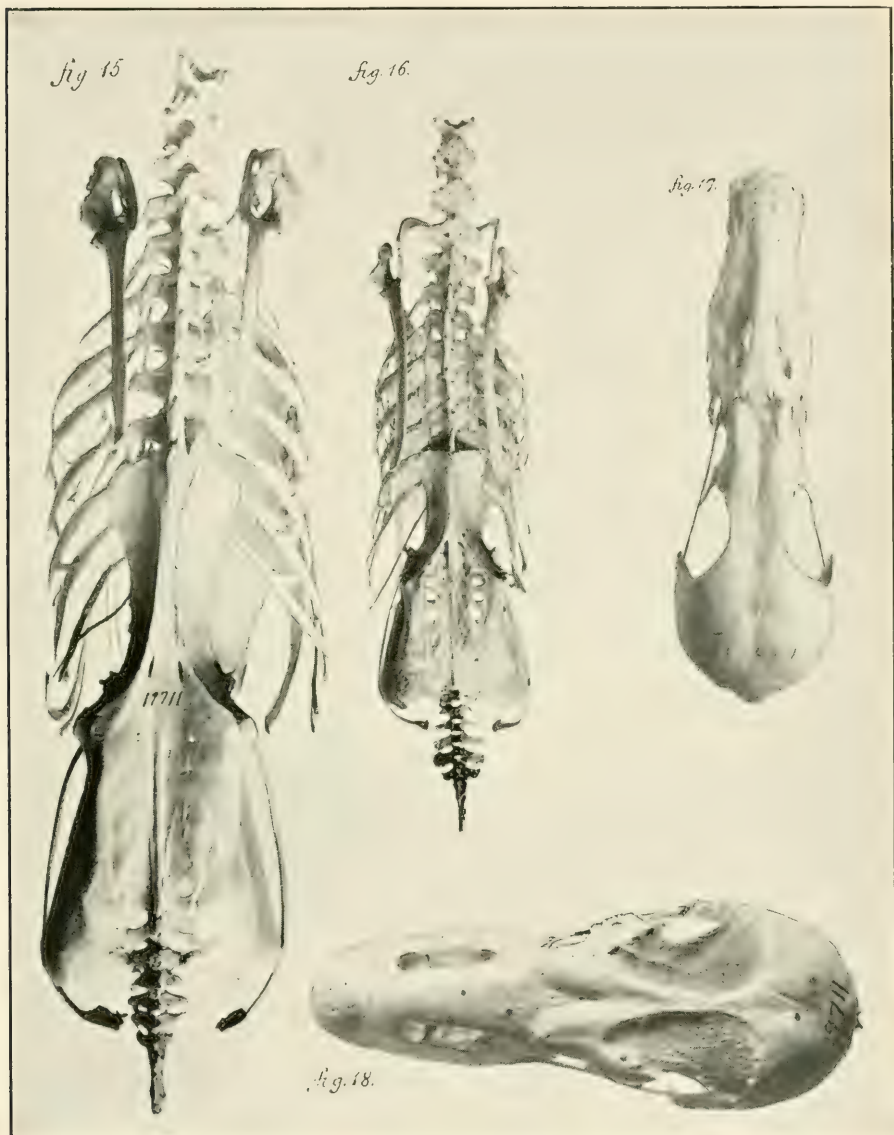
PLATE XXIX.

- Fig. 5.—Dorsal aspect of pelvis of *Chenonetta jubata*. All the bones on this plate belonged to the same individual, and are natural size. (No. 19,213, Coll. U.S. Nat. Mus.) It will be observed that the pelvis is broken and incomplete, as the specimen is sub-fossil, and was found in a cave in New Zealand (Otago).
- Fig. 6.—Left scapula, dorsal view, *Chenonetta jubata*. Same individual as described under fig. 5.
- Fig. 7.—Anterior aspect of the *os furculum*, *Chenonetta jubata*. Same individual as described under fig. 5.
- Fig. 8.—Anterior aspect of left *coracoid*, *Chenonetta jubata*. Same individual as described under fig. 5 of this plate.
- Fig. 9.—Anterior aspect of left *tarso-metatarsus*, *Chenonetta jubata*. Same individual as described under fig. 5. (No. 19,213, Coll. U.S. Nat. Mus.)
- Fig. 10.—Inner or anconal aspect of the right *carpo-metacarpus*, *Chenonetta jubata*, referred to under fig. 5 of this plate.
- Fig. 11.—Left *femur*, anterior aspect, *Chenonetta jubata*. See description under fig. 5 of this plate.
- Fig. 12.—Superior view of the *skull* of *Chenonetta jubata*. (No. 19,213, Coll. U.S. Nat. Mus.) Broken and imperfect. See account given under fig. 5 (*antea*).
- Fig. 13.—Inner or anconal aspect of right *humerus* of *Chenonetta jubata*. See fig. 5 of this plate for further description.
- Fig. 14.—Direct ventral aspect of the *sternum* of *Chenonetta jubata*. Same skeleton as shown in the other figures of this plate.

PLATE XXX.

- Fig. 15.—Nearly direct dorsal aspect of the *trunk skeleton* and *shoulder girdle* of *Cereopsis novæ-hollandiæ*, considerably reduced. What is here shown in the figure measures in the skeleton, mid-longitudinally, from the apex of the pygostyle to the most anterior point on the cervical vertebra, 29.3 cms. In the figure, the same line measures 18.3 cms. Figures of the skull of this individual are shown in fig. 1, Plate XXVIII., fig. 18 of the present plate, and fig. 19, Plate XXXI. (No. 19,711, Coll. U.S. Nat. Mus.) For a lateral view of this trunk skeleton, see fig. 25 of Plate XXXIII.
- Fig. 16.—Direct dorsal view of the *trunk skeleton* and *shoulder girdle* of *Hymenolæmus malacorhynchus*, ♀. (No. 19,024, Coll. U.S. Nat. Mus.) This trunk skeleton is reduced in the same proportion as that of *Cereopsis* shown in fig. 15 of this plate. (Collected by A. Reischek, Paringa, Westland, New Zealand.) The lateral view of this trunk skeleton is given in fig. 26 of Plate XXXIV., and the shoulder of the same individual in fig. 17 of this plate, fig. 3 of Plate XXVIII., fig. 20 of Plate XXXI. See also fig. 21 of Plate XXXI. for the *humerus*.
- Fig. 17.—Skull of *Hymenolæmus malacorhynchus*, ♀, from the same skeleton as the one referred to under fig. 16 of this plate. Natural size.





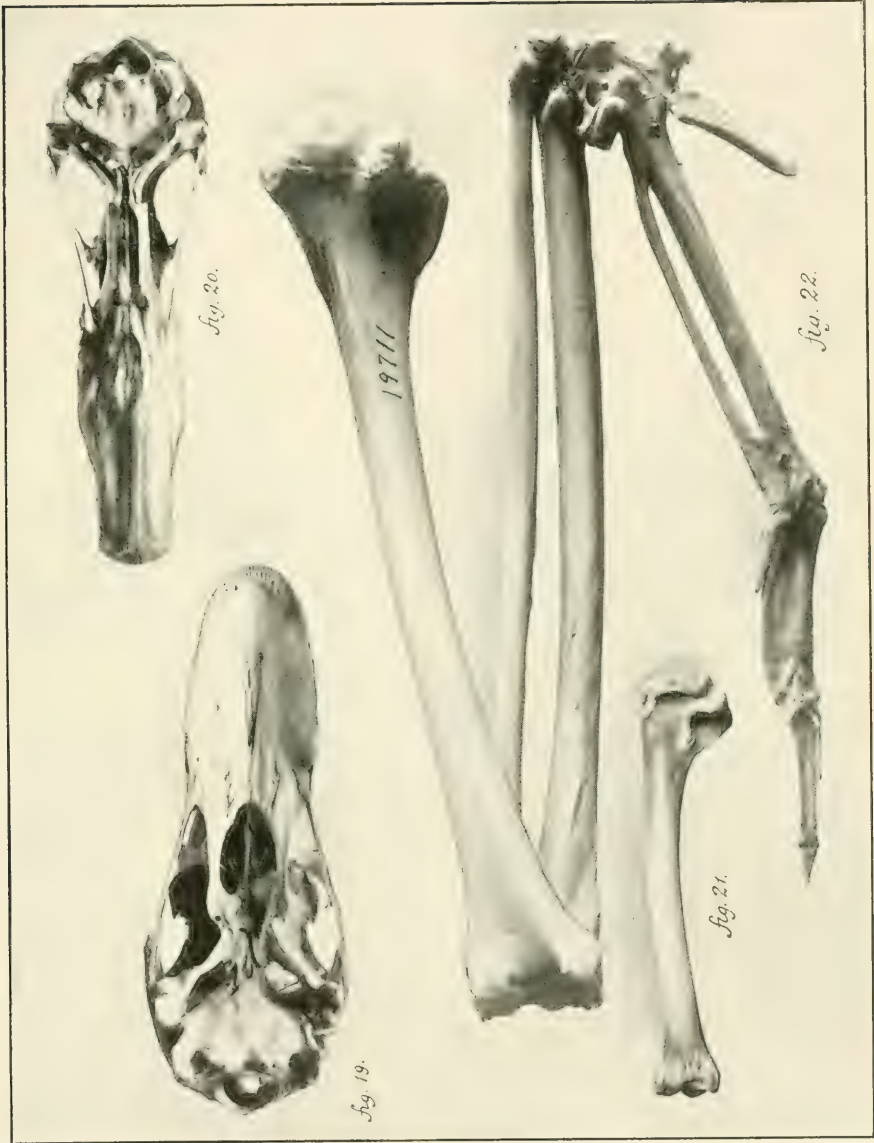


fig. 23.

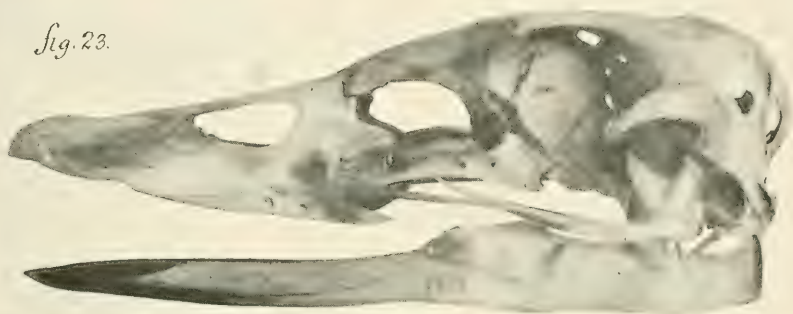
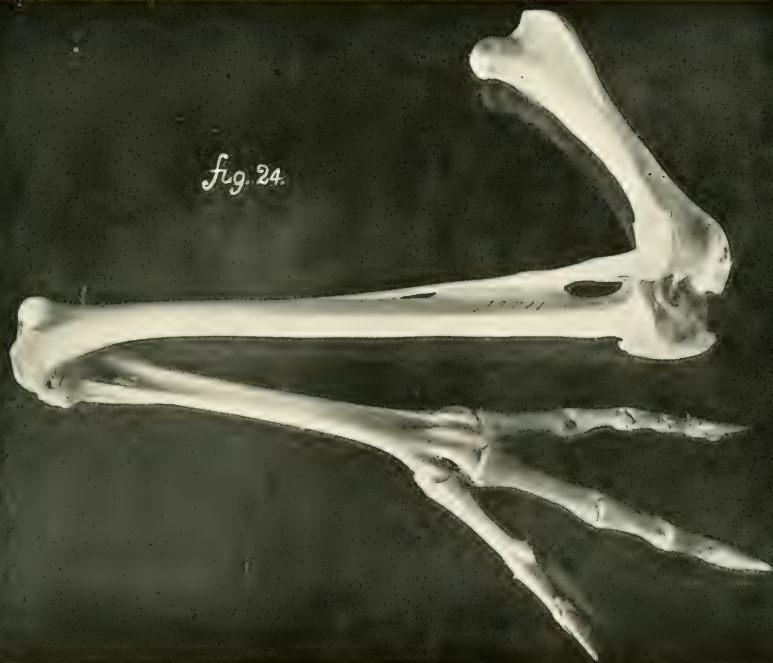
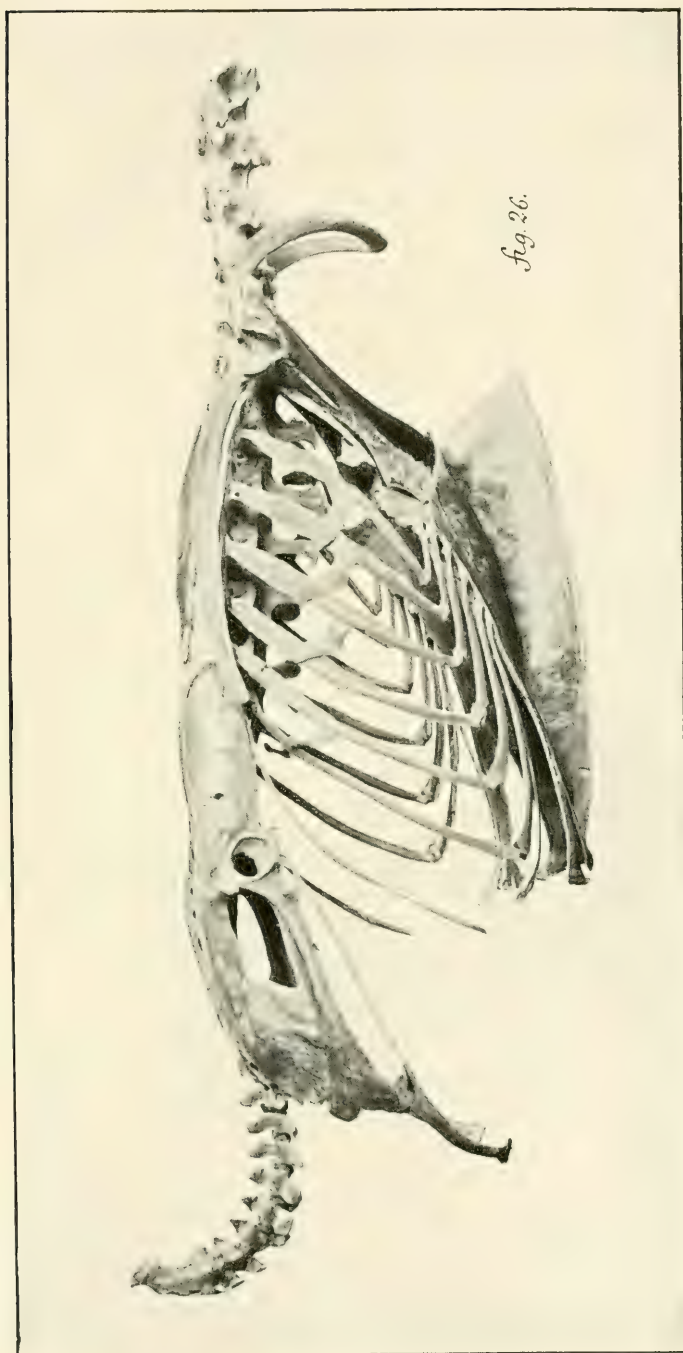


fig. 24.







- Fig. 18.—Superior view of the skull of *Cereopsis novæ-hollandiæ*. From same skeleton as other figures shown on the plates. Natural size. (See fig. 1, Plate XXVIII., fig. 10, Plate XXXI.)

PLATE XXXI.

- Fig. 19.—Basal view of the skull of *Cereopsis novæ-hollandiæ*. Slightly reduced. (Same skull as shown in other figures: Plate XXVIII., fig. 1, Plate XXX., fig. 18). Mandible removed.
- Fig. 20.—Basal view of the skull of *Hymenolæmus malacorrhynchus*. Slightly reduced; mandible removed. Same skull as shown in other figures: Plate XXVIII., fig. 3, Plate XXX., fig. 17.
- Fig. 21.—Direct anconal aspect of the left humerus of *Hymenolæmus malacorrhynchus*. Slightly reduced; actual length of this bone in the skeleton is 8.1 cms. From the same individual as furnished other bones and the skull on the plates. (No. 19,024, Coll. U.S. Nat. Mus.)
- Fig. 22.—Anconal aspect of the left pectoral limb of *Cereopsis novæ-hollandiæ*. From the skeleton of the same individual as shown on the other plates. (No. 19,711, Coll. U.S. Nat. Mus.) Slightly reduced; the actual length of the humerus in the skeleton is 16.8 cms., it being but 15.2 cms. in the figure.

PLATE XXXII.

- Fig. 23.—Left lateral aspect of the skull, including lower mandible, of *Tachyeres cinereus*. (No. 1,818, Coll. U.S. Nat. Mus.) Natural size. Collected by Dr. Tolmie on the Falkland Islands. A shot-hole is seen in the occipital region, between the squamosal process and the left supra-occipital foramen. The bones at the middle third of the zygoma are partially disarticulated. The vomer is seen arching above the palatines, and the interorbital plate is entire.
- Fig. 24.—Left pectoral limb of *Cereopsis novæ-hollandiæ*, from the skeleton of the same individual as shown in other plates. (No. 19,711, Coll. U.S. Nat. Mus.) The femur is shown antero-laterally; the tibio-tarsus on almost direct inner aspect, as is also the fibula. The tarso-metatarsus and the bones of pes are seen on almost direct dorsal view. Much reduced. The extreme length of the tibio-tarsus in the skeleton measures from apex of cnemial process to most distant point on inner condyle, 16.4 cms., and the basal joint of mid-toe has a length of 3.1 cms. in the skeleton of this foot.

PLATE XXXIII.

- Fig. 25.—Left lateral view of the trunk skeleton and shoulder girdle of *Cereopsis novæ-hollandiæ*. (No. 19,711, Coll. U.S. Nat. Mus.) Very considerably reduced. For actual measurements see description of fig. 15 of Plate XXX.

PLATE XXXIV.

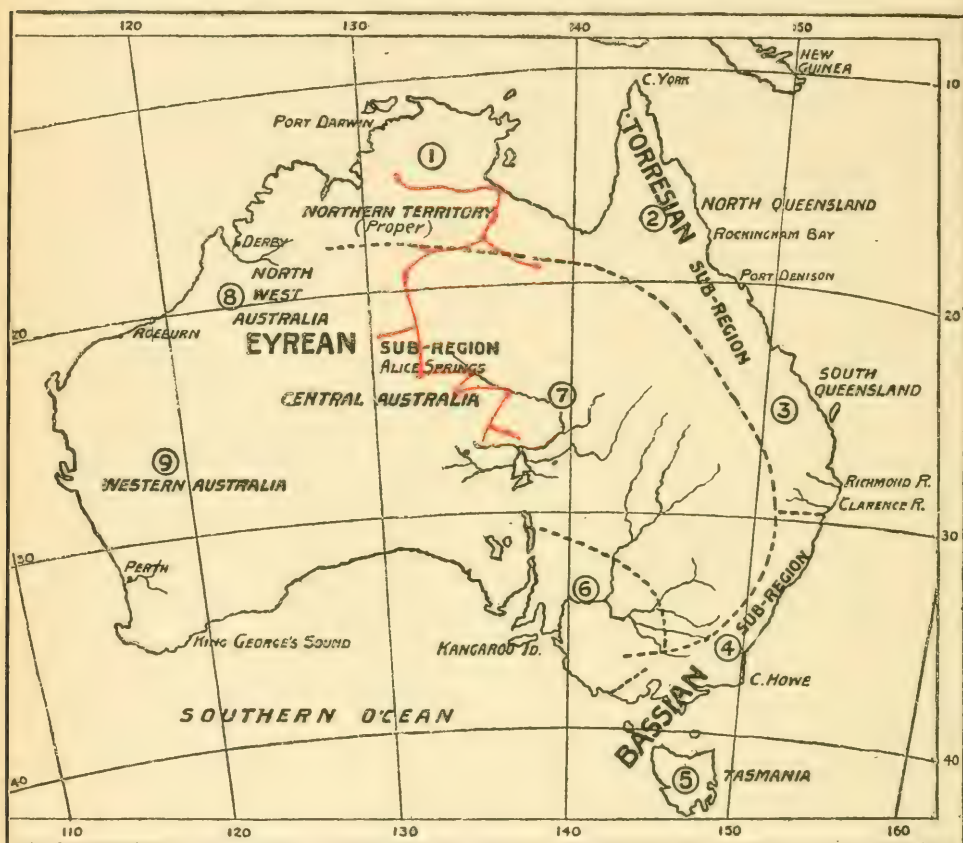
- Fig. 26.—Right lateral aspect of the trunk skeleton and shoulder girdle of *Hymenolæmus malacorrhynchus*. (No. 19,024, Coll. U.S. Nat. Mus.) Very considerably reduced. For actual measurements see description of fig. 16, Plate XXX.

Ornithological Notes, Barclay Expedition.

BY G. F. HILL.

FROM OODNADATTA TO BORROLOOLA.

THE following ornithological notes* were collected during the journey from Oodnadatta (S.A.) to Borroloola (N.T.), *via* Alice Springs, Newcastle Waters, and Anthony's Lagoon, between the



Map.—Red lines indicate route of Expedition.

months of February and September, 1911, and in the M'Arthur River district between the months of September, 1911, and April, 1912.

* Nomenclature according to "Hand-list of the Birds of Australasia," by Gregory M. Mathews (Supplement to *The Emu*, vol. vii., January, 1908). Measurements of birds were taken in the flesh, and are given in millimetres. Measurements of eggs are given in millimetres. The colours of soft parts were noted in the field immediately after death.

With the exception of a few light showers at Alice Springs, no rain fell during the overland trip, nor did we see any indications of rain having fallen recently in the desert north of Macdonnell Ranges. As a consequence, the country was very dry, the vegetation parched, and surface water scarce. Added to these unfavourable conditions for ornithological work, we were constantly on the move while travelling over the most interesting parts on the route, leaving little time for collecting and preparing specimens of any kind. No eggs were found until after our arrival at Borroloola.

Excepting at the bores, we saw very little bird-life until we reached Dalhousie Station. At the bores Little Eagles (*Eutamias morphnoides*), Warbling Grass-Parrakeets (*Melopsittacus undulatus*), Rose-breasted Cockatoos (*Cacatua roseicapilla*), Yellow-banded Parrakeets (*Barnardius zonarius*), Chestnut-eared Finches (*Tæniopygia castanotis*), Pallid Honey-eaters (*Ptilotis leilavalensis*) and Crows (*Corvus coronoides*) were plentiful, while Yellow-tinted Tree-Tits (*Smicrornis flavescens*), Crested Pigeons (*Ocyphaps lophotes*), Tawny-shouldered Podargus (*Podargus strigoides*) were noticed in the scrubby country near the station.

At Dalhousie Station there is a considerable area of swampy country and several large springs, where water-fowl are said to be very plentiful as a rule; but at the time of our visit (13th February) Ducks were somewhat scarce, although other water-fowl were plentiful. The following birds were identified in this locality:—Black Duck (*Anas superciliosa*), White-eyed Duck (*Aythya australis*), Teal (*Nettion castaneum*), Mountain Duck (*Casarca tadornoides*), Plumed Egret (*Mesophoyx plumifera*), White-fronted Heron (*Notophoyx novæ-hollandiæ*), White Ibis (*Ibis molucca*), Coot (*Fulica australis*), Pied Cormorant (*Phalacrocorax hypoleucus*), Purple-backed Wren (*Malurus assimilis*), Pied Robin (*Petræca picata*), Red-capped Robin (*Petræca goodenovii*), Black-and-White Fantail (*Rhipidura tricolor*), Singing Honey-eater (*Ptilotis sonora*), Pipit (*Anthus ausiralis*), Crested Pigeon (*Ocyphaps lophotes*), Crow (*Corvus coronoides*), and Little Eagle (*Eutamias morphnoides*).

I was unable to ascertain the temperature of the water in the large hot spring in the deeper parts, where Ducks, Coots, and small fish were seen, but near the banks, at 1 foot from the surface, a temperature of 110° F. was recorded; at 6 feet from the banks, and at 1 foot from the surface, the temperature rose to 112° F.

Between Dalhousie and Charlotte Waters bird-life was very scarce. Brown Hawks (*Hieracidea berigora*), Cockatoo-Parrakeets (*Calopsittacus novæ-hollandiæ*), Black-banded Whitefaces (*Aphelocephala nigricincta*), Chestnut-backed Ground-Birds (*Cinclosoma castanonotum*), Black-faced Wood-Swallows (*Artamus melanops*), Pipits (*Anthus australis*), and Chestnut-eared Finches (*Tæniopygia castanotis*) were identified in this stony table-land country.

At Charlotte Waters (20th February) the country was very dry, and presented a very desolate appearance, but birds were

numerous at the bore. The following species were identified:—Yellow-throated Miner (*Myzantha flavigula*), Pallid Honey-eater (*Ptilotis leilavalensis*), Black-and-White Fantail (*Rhipidura tricolor*), Magpie-Lark (*Grallina picata*), Black-banded Whiteface (*Aphelocephala nigricincta*), Chestnut-eared Finch (*Taniopygia castanotis*), Crow (*Corvus coronoides*), Yellow-banded Parrakeet (*Barnardius zonarius*), Warbling Grass-Parrakeet (*Melopsittacus undulatus*), Cockatoo-Parrakeet (*Calopsittacus novæ-hollandiæ*), Crested Pigeon (*Ocyphaps lophotes*), Wedge-tailed Eagle (*Uroæthus audax*), Western Brown Hawk (*Hieracidea orientalis*), Kite (*Milvus affinis*), Kestrel (*Cerchneis cenchroides*), Bell-Bird (*Oreoica cristata*), Purple-backed Wren (*Malurus assimilis*).

After leaving Charlotte Waters (23rd February) the country became more varied, but the same scarcity of birds and animals was noticeable. The following species of birds were noticed between our last camp and Horseshoe Bend (105 miles S. by E. of Alice Springs, approximately):—Spiny-cheeked Honey-eater (*Acanthogenys ruficularis*), Yellow-throated Miner (*Myzantha flavigula*), Mistletoe-Bird (*Dicaeum hirundinaceum*), Red-backed Kingfisher (*Halcyon pyrrhopygius*), White-backed Magpie (*Gymnorhina leuconota*), Black-throated Butcher-Bird (*Cracticus nigrigularis*), Western Brown Hawk (*Hieracidea orientalis*), Brown Hawk (*H. berigora*), Square-tailed Kite (*Lophoictinia isura*), Little Eagle (*Eutolmaëtus morphnoides*), Pardalote (*Pardalotus*, sp.), Magpie-Lark (*Grallina picata*), Yellow-banded Parrakeet (*Barnardius zonarius*), Black-faced Wood-Swallow (*Artamus melanops*), Crow (*Corvus coronoides*), Crested Pigeon (*Ocyphaps lophotes*), Chestnut-eared Finch (*Taniopygia castanotis*), Black-banded Whiteface (*Aphelocephala nigricincta*).

We left the Overland Telegraph Line at Horseshoe Bend and turned north-westward, generally along the Finke River, to Idracowra Waterhole, where a halt was made for a few days (3rd March). In addition to the preceding list, the following were identified:—Black-shouldered Kite (*Elanus axillaris*), Wedge-tailed Eagle (*Uroæthus audax*), Whistling Eagle (*Haliastur sphenurus*), Kestrel (*Cerchneis cenchroides*), Goshawk (*Astur fasciatus*), Kite (*Milvus affinis*), Red-tailed Cockatoo (*Calyptorhynchus stellatus*), Pink Cockatoo (*Cacatua leadbeateri*), Cockatoo-Parrakeet (*Calopsittacus novæ-hollandiæ*), Singing Honey-eater (*Ptilotis sonora*), Pallid Honey-eater (*Ptilotis leilavalensis*), Yellow-tinted Tree-Tit (*Smicrornis flavescens*), Red-capped Robin (*Petræa goodenovii*), Black-and-White Fantail (*Rhipidura tricolor*), Black-and-White Swallow (*Cheramæca leucosternum*), Pipit (*Anthus australis*), Red-breasted Babbler (*Pomatostomus rubeculus*), Bee-eater (*Merops ornatus*), Pelican (*Pelecanus conspicillatus*).

The following species were identified in the vicinity of Hermannsburg and Alice Springs in April and May:—Wedge-tailed Eagle (*Uroæthus audax*), Whistling Eagle (*Haliastur sphenurus*), Kite (*Milvus affinis*), Kestrel (*Cerchneis cenchroides*), Brown Hawk

(*Hieracidea berigora*), Goshawk (*Astur fasciatus*), Purple-backed Wren (*Malurus assimilis*), Little Dove (*Geopelia cuneata*), Bronze-winged Pigeon (*Phaps chalcoptera*), Plumed-Pigeon (*Lophophaps leucogaster*), Crested Pigeon (*Ocyphaps lophotes*), Black Duck (*Anas superciliosa*), Pink-eared Duck (*Malacorhynchus membranaceus*), White-eyed Duck (*Aythya australis*), Bustard (*Eupodotis australis*), Pink Cockatoo (*Cacatua leadbeateri*), Red-tailed Cockatoo (*Calyptorhynchus stellatus*), Warbling Grass-Parrakeet (*Melopsittacus undulatus*), Cockatoo - Parrakeet (*Calopsittacus novæ-hollandiæ*), Yellow-banded Parrakeet (*Barnardius zonarius*), Yellow-spotted Bower-Bird (*Chlamydodera guttata*), White-browed Tree-creeper (*Climacteris superciliosus*), Black-throated Butcher-Bird (*Cracticus nigrigularis*), White-backed Magpie (*Gymnorhina leuconota*), Black-backed Magpie (*Gymnorhina tibicen*), Pied Robin (*Petræa picata*), Red-capped Robin (*Petræa goodenovii*), Black-and-White Fantail (*Rhipidura tricolor*), Bell-Bird (*Oreoica cristata*), Wedgebill (*Sphenostoma cristatum*), Pallid Cuckoo (*Cuculus inornatus*), Grass-Wren (*Amytornis textilis*), Yellow-throated Miner (*Myzantha flavigula*), Brown-headed Honey-eater (*Melithreptus brevirostris*), Singing Honey-eater (*Ptilotis sonora*), Pallid Honey-eater (*Ptilotis leilavalensis*), Crow (*Corvus coronoides*), Black-banded Whiteface (*Aphelocephala nigricincta*), Red-breasted Babbler (*Pomatostomus rubeculus*), White-browed Babbler (*Pomatostomus superciliosus*), Pipit (*Anthus australis*), Black-and-White Swallow (*Cheramæca leucosternum*), Black-faced Wood-Swallow (*Artamus melanops*), Chestnut-eared Finch (*Taniopygia castanotis*), Black-faced Cuckoo-Shrike (*Coracina robusta*), White-fronted Heron (*Notophox novæ-hollandiæ*), Black-fronted Dottrel (*Ægialitis melanops*), Tricoloured Chat (*Ephthianura tricolor*), Orange-fronted Chat (*Ephthianura aurifrons*).

Measurements of birds collected at Alice Springs during April:—

***Climacteris superciliosus*—**

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|-------|---------------|-------|---------|-------|-------|
| ♂ | 140 | 85 | 17 | 13 | 55 |
| ♂ (?) | 158 | 86 | 17 | 12 | 58 |

Irides umber, feet dark horn, bill black.

***Lophophaps leucogaster*—**

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|---|---------------|-------|---------|-------|-------|
| ♂ | 230 | 115 | 22 | 14 | 71 |

Irides gold, feet smoky red, bill black.

***Ephthianura aurifrons*—**

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|---|---------------|-------|---------|-------|-------|
| ♀ | 121 | 64 | 18 | 12 | 40 |
| ♀ | 125 | 65 | 19 | 11 | 40 |

***Gymnorhina tibicen*—**

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|---|---------------|-------|---------|-------|-------|
| ♂ | 390 | 243 | 52 | 50 | 141 |

In immature plumage.

Ocyphaps lophotes—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|--|---------------|--------|---------|-------|-------|
| | 330 .. | 160 .. | 26 .. | 15 .. | 135 |

Irides deep orange, feet and around eye dark coral pink.

Calyptorhynchus stellatus—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|---|---------------|--------|---------|-------|-------|
| ♀ | 546 .. | 380 .. | 18 .. | 53 .. | 260 |

Measurements of birds collected at Simpson's Gap, near Alice Springs (1/5/11), on rocky hillsides :—

Amytornis textilis—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|---|---------------|-------|---------|---------|-------|
| ♂ | 177 .. | 59 .. | 24.5 .. | 13 .. | 85 |
| ♂ | 163 .. | 59 .. | 22.5 .. | 11 .. | 79 |
| ♀ | 165 .. | 59 .. | 24.5 .. | 12.5 .. | 83 |

Irides light umber, feet and bill dark horn.

Crop contents—seeds of acacia, seeds of *Triodia*, sp., and sand.

Birds identified at Hugh River, Macdonnell Ranges, 4th May, 1911 :—Singing Honey-eater (*Ptilotis sonora*), Spiny-cheeked Honey-eater (*Acanthogenys ruficularis*), Pipit (*Anthus australis*), White-fronted Heron (*Notophoxyx novæ-hollandiæ*), Black-fronted Dottrel (*Ægialitis melanops*), Black-tailed Native-Hen (*Microtribonyx ventralis*), Black-throated Grebe (*Podiceps novæ-hollandiæ*), Wood-Duck (*Chenonetta jubata*), Pink-eared Duck (*Malacorhynchus membranaceus*), Pied Robin (*Petraca picata*), Chestnut-eared Finch (*Taniopygia castanotis*), Crested Pigeon (*Ocyphaps lophotes*), Bronze-winged Pigeon (*Phaps chalcoptera*).

Measurements of birds collected at Hugh River :—

Malacorhynchus membranaceus—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|---|---------------|--------|---------|-------|-------|
| ♂ | 410 .. | 192 .. | 38 .. | 68 .. | 82 |
| ♀ | 397 .. | 188 .. | 30 .. | 65 .. | 71 |

Irides light umber, feet dark grey; bill dark horn, whitish tip to lower mandible.

Birds identified 15 miles west of Hugh River, on stony ridges, near foot of Macdonnell Ranges :—White-backed Magpie (*Gymnorhina leuconota*), Redthroat (*Pyrrolaemus brunnea*), Bell-Bird (*Oreoica cristata*), Square-tailed Cuckoo (*Cacomantis flabelliformis*).

Measurements of birds collected at Cumming's Camp, Ellery's Creek, Macdonnell Ranges (55 miles west of Alice Springs, approximately) (7/5/11) :—

Chenonetta jubata—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|---|---------------|--------|---------|-------|-------|
| ♂ | 500 .. | 260 .. | 50 .. | 30 .. | 108 |
| ♀ | 462 .. | 255 .. | 44 .. | 26 .. | 106 |

Irides dark umber, feet grey; bill—male black, female light horn.

There is some very remarkable scenery and abundance of water in the ranges here, but fewer birds were seen than in the open country. *Amytornis textilis* (Grass-Wren) were plentiful both in the gorges and on the porcupine-grass-covered rises at the foot of the ranges. *Petræca picata* (Pied Robin) were also plentiful on these rises. *Emblema picta* (Painted Finch) were met with for the first time during the journey on the slopes of the deep and sheltered gorges.

At about 75 miles west by north of Alice Springs we crossed the northernmost of a series of parallel ranges that form the great Macdonnell Ranges, and continued westward over level and (for the most part) acacia-covered plains. Bird-life now became even scarcer than on the southern side of the ranges. Occasionally we flushed Parrakeets in the dense scrub, but they were more often heard than seen. *Gymnorhina tibicen* (Black-backed Magpie) and *G. leuconota* were seen in company several times in the more open country. *Corvus coronoides* and *Uroaetus audax* were occasionally seen overhead. Large flocks of *Calyptorhynchus stellatus* (Red-tailed Cockatoo) were noticed near Mount Zeal.

Nothing further of interest to an ornithologist was met with until we reached Haast's Bluff (135 miles W. by N. of Alice Springs, approximately). Here, at a small and very polluted spring, bird-life was represented by numbers of *Taniopygia castanotis* (Chestnut-eared Finch), *Corvus coronoides* (Crow), *Emblema picta* (Painted Finch), *Lophophaps ferruginea* (Red Plumed-Pigeon), and a few pairs of *Ptilotis keartlandi* (Kearland Honey-eater).

At another spring, a few miles further to the westward, birds were more plentiful, and I took advantage of several days' halt in this neighbourhood to add as much as possible to the collections of plants, insects, &c.

The following birds were identified here (No. 1 Camp, lat. 23° 18' 36" S., long. 131° 47' E., altitude 2,578 feet):—*Taniopygia castanotis* (Chestnut-eared Finch), *Emblema picta* (Painted Finch), *Lophophaps leucogaster* (Plumed-Pigeon), *Dromæus novæ-hollandiæ* (Emu), *Oreoica cristata* (Bell-Bird), *Amytornis textilis* (Grass-Wren), *Corvus coronoides* (Crow), *Cracticus nigrigularis* (Black-throated Butcher-Bird), *Petræca picata* (Pied Robin), *Acanthiza uropygialis* (Chestnut-rumped Tit), *Ptilotis sonora* (Singing Honey-eater), *Ptilotis keartlandi* (Kearland Honey-eater), *Ptilotis leilavalensis* (Pallid Honey-eater), *Hieracidea berigora* (Brown Hawk), *Falco lunulatus* (Little Falcon), *Eutolmaetus morphnoides* (Little Eagle), *Gypoictinia melanosternum* (Black-breasted Buzzard), *Uroaetus audax* (Wedge-tailed Eagle), *Cerchneis cenchroides* (Kestrel), *Haliastur sphenurus* (Whistling Eagle), Goshawk (*Astur fasciatus*), Tawny-shouldered Frogmouth (*Podargus strigoides*), *Anthus australis* (Pipit), *Rhipidura tricolor* (Black-and-White Fantail), *Geopelia cuneata* (Little Dove), *Cheramæca leucosternum* (Black-and-White Swallow).

Measurements, &c., of birds collected at this camp (28th May):—

Ptilotis keartlandi—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------|---------------|-------|---------|-------|-------|
| ♂ .. | 163 .. | 80 .. | 20 .. | 12 .. | 66 |

Irides light amber, feet light horn; bill black, gape yellow.

Acanthiza uropygialis—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|--------------|---------------|-------|---------|--------|-------|
| (a) ♂ (?) .. | 100 .. | 53 .. | 15.5 .. | 7.5 .. | 40 |

Irides cream, feet and bill black.

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|----------|---------------|-------|---------|-------|-------|
| (b) ♂ .. | 115 .. | 54 .. | 20 .. | 9 .. | 49 |

Irides chestnut, feet and bill black.

Rump and upper tail coverts earthy-brown (not chestnut, as in *a*).
Under tail coverts and flanks pale sandy-buff, abdomen white, in both specimens. Fairly numerous on level country.

Lophophaps leucogaster—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------|---------------|--------|---------|-------|-------|
| ♂ .. | 217 .. | 110 .. | 20 .. | 15 .. | 75 |

Irides orange, feet dark purple, bill dark greyish-horn.

Crop contents, seeds of porcupine-grass.

Oreoica cristata—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------|---------------|--------|---------|-------|-------|
| ♂ .. | 219 .. | 103 .. | 25 .. | 19 .. | 85 |

Irides dark orange, feet grey, bill light horn.

Crop contents, *Coleoptera* (beetles).

Found on the mulga-covered plains.

Emblema picta—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------|---------------|-------|---------|---------|-------|
| ♂ .. | 107 .. | 55 .. | 14 .. | 11 .. | 33 |
| ♂ .. | 115 .. | 60 .. | 13.5 .. | 11 .. | 40 |
| ♂ .. | 120 .. | 57 .. | 14 .. | 11.5 .. | 42 |
| ♂ .. | 117 .. | 58 .. | 15 .. | 11 .. | 38 |
| ♀ .. | 110 .. | 55 .. | 15 .. | 11.5 .. | 35 |
| ♀ .. | 110 .. | 55 .. | 13 .. | 10.5 .. | 38 |
| ♀ .. | 120 .. | 57 .. | 12 .. | 11 .. | 38 |

Irides pale straw, feet light horn; bill—upper mandible black, sometimes with red tip, lower mandible red.

Found on rocky hillsides.

Ptilotis sonora—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------|---------------|-------|---------|-------|-------|
| ♂ .. | 198 .. | 93 .. | 23.5 .. | 17 .. | 85 |

Irides dark amber, feet grey; bill black, gape yellow.

Crop contents, *Formicidae* (ants).

Petræca picta—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------|---------------|-------|---------|-------|-------|
| ♀ .. | 158 .. | 90 .. | 21 .. | 12 .. | 63 |

Irides dark amber, feet and bill black.

Filaria, sp., found in orbits.

Aphelocephala castaneiventris—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------|---------------|-------|---------|-------|-------|
| ♀ .. | 118 | 58 | 17 | 8 | 46 |

Irides white, feet and bill black.

Falco lunulatus—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------|---------------|-------|---------|-------|-------|
| ♀ .. | 350 | 270 | 37 | 18 | 142 |

Irides umber, feet and cere yellow, bill grey.

Filaria, sp., in liver and abdominal cavity, also *Dipteron* (resembling *Olfersa*) in plumage.

Very few birds were seen in the sand-hill and mulga country north of No. 1 Camp (*Corvus coronoides*, *Barnardius zonarius*, and *Pardalotus*, sp., were identified), but they were more numerous at a small and apparently permanent rock-hole about 45 miles to the northward of No. 1 Camp. Two days were spent in this locality (Camp No. 2, lat. 22° 47' 43" S., long. 131° 35' 35" E.), during which the collections were considerably increased.

Measurements, &c., of birds collected (3rd June):—

Glycyphila albifrons—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------|---------------|-------|---------|-------|-------|
| ♂ .. | 186 | 83 | 20.5 | 18 | 81 |
| ♂ .. | 186 | 83 | 20 | 18 | 74 |

Irides brown, feet and bill black.

Crop contents—*Apidæ* (bees), *Formicidæ* (ants), small *Coleoptera* (beetles).

Ptilotis keartlandi—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|--|---------------|-------|---------|-------|-------|
| | 158 | 73 | 20 | 12.5 | 61 |

Irides umber, feet light horn; bill black, gape yellow.

Crop contents—*Formicidæ* and other small *Hymenoptera*.

Myzantha flavigula—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|--|---------------|-------|---------|-------|-------|
| | 245 | 119 | 30 | 22 | 105 |

Artamus melanops—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------|---------------|-------|---------|-------|-------|
| ♀ .. | 185 | 122 | 20 | 16 | 73 |

Irides dark umber, feet grey, bill bluish-grey with black tip.

Crop contents—*Formicidæ* (*Iridomyrmex*, sp.)

Malurus, sp. (immature)—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------|---------------|-------|---------|-------|-------|
| ♂ .. | 129 | 46 | 19.5 | 8.5 | 60 |

Irides dark umber, feet and bill brownish-horn.

Collected near summit of low, barren, stony range.

Other birds identified:—*Astur fasciatus* (Goshawk), *Uroæetus audax* (Wedge-tailed Eagle), *Tæniopygia castanotis* (Chestnut-eared Finch), *Emblema picta* (Painted Finch), *Lophophaps leucogaster* (Plumed-Pigeon), *Rhipidura tricolor* (Black-and-White Fantail), *Petræca picata* (Pied Robin), *Ægotheles novæ-hollandiæ*

(Owlet Nightjar), *Acanthogenys ruficularis* (Spiny-checked Honey-eater), *Melithreptus lætior* (Golden-backed Honey-eater).

I consider this camp an ideal base for a scientific party to work from on account of the great variety of country within easy reach of it.

After leaving this camp we travelled about 35 miles in a north-easterly direction without seeing any bird-life, but about 50 miles out birds were very numerous on some scrubby flats amongst low red sandstone ranges. Numerous Emu and Bustard (*Eupodotis australis*) tracks were noticed on some cotton-bush and salt-bush flats.

The following birds were identified:—*Petræca goodenovii* (Red-capped Robin), *Petræca picata* (Pied Robin), *Philotis sonora* (Singing Honey-eater), *Rhipidura tricolor* (Black-and-White Fantail), *Oreocica cristata* (Bell-Bird), *Ephthianura aurifrons* (Orange-fronted Chat), *Ephthianura tricolor* (Tricoloured Chat), *Anthus australis* (Pipit). The two species of *Ephthianura* were in company in small flocks of from 20 to 30 birds.

At a fine permanent waterhole in Lander Creek (No. 3 Camp, lat. 22° 2' 1" S., long. 8° 49' 52", altitude 2,135 feet), birds were still more plentiful. The following were identified:—*Cacatua roseicapilla* (Rose-breasted Cockatoo), *Phaps chalcoptera* (Bronze-winged Pigeon), *Ocyphaps lophotes* (Crested Pigeon), *Lophotes leucogaster* (Plumed-Pigeon), *Geopelia cuneata* (Little Dove), *Uroæthus audax* (Wedge-tailed Eagle), *Haliastur spheurnus* (Whistling Eagle), *Falco lunulatus* (Little Falcon), *Hieracidea berigora* (Brown Hawk), *Podiceps novæ-hollandiæ* (Black-throated Grebe), *Nettion castaneum* (Teal), *Ægialitis melanops* (Black-fronted Dottrel), *Grallina picata* (Mud-Lark), *Philotis leilavalensis* (Pallid Honey-eater), *Myzantha flavigula* (Yellow-throated Miner), *Amytornis textilis* (Grass-Wren), *Rhipidura tricolor* (Black-and-White Fantail), *Rhipidura albicauda* (?) (White-tailed Fantail), *Petræca goodenovii* (Red-capped Robin), *Petræca picata* (Pied Robin), *Taniopygia castanotis* (Chestnut-eared Finch), *Emblema picta* (Painted Finch), *Anthus australis* (Pipit), *Ephthianura aurifrons* (Orange-fronted Chat), *Ephthianura tricolor* (Tricoloured Chat), *Smicrornis flavescens* (Yellow-tinted Tree-Tit), *Cracticus nigrigularis* (Black-throated Butcher-Bird), *Cheramæca leucosternum* (Black-and-White Swallow), *Petrochelidon ariel* (Fairy Martin).

Emblema picta and *Amytornis textilis* were not seen further north than this camp, though probably both species would be found on Mount Barkly and neighbouring hills, which are similar to those at No. 3 Camp, and about 10 miles to the northward.

Measurements, &c., of birds collected at this camp (9th June):—

Podiceps novæ-hollandiæ—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|-------|---------------|-------|---------|-------|-------|
| (a) ♀ | 277 | 110 | 35 | 19 | 36 |

Irides grey, feet greenish-yellow; bill light horn, culmen dark horn, gape greenish.

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|----------|---------------|--------|---------|-------|-------|
| (b) ♀ .. | 263 .. | 110 .. | 34 .. | 21 .. | 25 |

Irides yellow, feet greenish-horn; bill yellowish-horn, culmen black, gape yellow.

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|----------|---------------|-------|---------|-------|-------|
| (c) ♂ .. | 250 .. | 97 .. | 32 .. | 18 .. | 30 |

Irides yellow; bill light horn, culmen dark horn, gape yellow.

Phaps chalcoptera—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------|---------------|--------|---------|-------|-------|
| ♀ .. | 306 .. | 180 .. | 28 .. | 19 .. | 120 |

Irides dark umber, feet reddish-purple, bill black.

Malurus, sp.—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|-------------|---------------|-------|---------|--------|-------|
| Sex (?) .. | 129 .. | 46 .. | 19 .. | 8.5 .. | 68 |
| ♂ (imm.) .. | 129 .. | 45 .. | 18 .. | 8.5 .. | 64 |

Shot on slope of low range.

Smicrornis flavescens—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------------|---------------|-------|---------|--------|-------|
| ♀ .. | 89 .. | 47 .. | 15 .. | 5.5 .. | 35 |
| Sex (?) .. | 84 .. | 44 .. | 14 .. | 5 .. | 33 |
| Sex (?) .. | 86 .. | 47 .. | 17 .. | 6 .. | 33 |

After leaving this fine waterhole we followed the Lander down through acacia and spinifex country to Camp No. 4 (lat. 21° 26' 33" S., long. 8 hrs. 49 min. 52 sec. E.), passing several soaks in the bed of the creek on our way. Several small flocks of Emus were seen, and, judging by the number of tracks in this locality, these birds must be very numerous indeed. I noticed here, as elsewhere, that it is very difficult to approach kangaroos, Emus, and even small birds with camels—quite the reverse of my experience when mounted on horseback.

The following birds were identified in the vicinity of No. 4 Camp (14th June):—*Dromæus novæ-hollandiæ* (Emu), *Eupodotis australis* (Bustard), *Burhinus grallarius* (Stone-Plover), *Phaps chalcoptera* (Bronze-winged Pigeon), *Ocyphaps lophotes* (Crested Pigeon), *Pteropodocys phasianella* (Ground Cuckoo-Shrike), *Rhipidura tricolor* (Black-and-White Fantail), *Uroaetus audax* (Wedge-tailed Eagle), *Hieracidea berigora* (Brown Hawk), *Haliastur sphenurus* (Whistling Eagle), *Falco lunulatus* (Little Falcon), *Ninox boobook* (Boobook Owl), *Artamus melanops* (Black-faced Wood-Swallow), *Cheramæca leucosternum* (Black-and-White Swallow), *Dicæum hirundinaceum* (Mistletoe-Bird), *Barnardius zonarius* (Yellow-banded Parrakeet), *Ptilotis sonora* (Singing Honey-eater), *Ptilotis leilavalensis* (Pallid Honey-eater), *Ptilotis keartlandi* (Kearland Honey-eater), *Corvus coronoides* (Crow), *Cinclorhamphus cruralis* (Brown Song-Lark), *Anthus australis* (Pipit), *Stipiturus*, sp.* (Emu-Wren), *Tæniopygia castanotis* (Chestnut-eared Finch), *Gymnorhina leuconota* (White-

* Probably *S. ruficeps*.

backed Magpie), *Cracticus nigrigularis* (Black-throated Butcher-Bird), *Ægialitis melanops* (Black-fronted Dottrel).

In some very stunted box (*Eucalyptus*) and spinifex country 20 miles west of the camp we met with *Amytornis rufa* (Rufous Grass-Wren)* and *Malurus cyanotus* (White-winged Wren) for the first time. *Cacatua leadbeateri* (Pink Cockatoo), *Artamus melanops* (Black-faced Wood-Swallow), *Ptilotis sonora* (Singing Honey-eater), *Ptilotis keartlandi* (Kearland Honey-eater), *Halcyon pyrrhopygius* (Red-backed Kingfisher), *Hieracidea orientalis* (Western Brown Hawk), *Eupodotis australis* (Bustard), *Burhinus grallarius* (Stone-Plover), *Gypoictinia melano-sternum* (Buzzard), were noticed in the same locality. We travelled 50 miles further west without seeing any birds or animals, excepting a few *Amytornis rufa* (Rufous Grass-Wren).

This country was the poorest and most barren of any encountered throughout the journey. About 30 miles north-west of the camp *Acanthogenys ruficularis* (Spiny-cheeked Honey-eater) were very numerous in some flowering shrubs, and *Stipiturus ruficeps* (Rufous-crowned Emu-Wren) were occasionally seen in the spinifex. These little birds moved with such rapidity from shelter to shelter that it was impossible to get a shot from the camel's back.

Measurements of birds collected near Camp No. 4:—

***Amytornis rufa*—**

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|----------|---------------|-------|---------|-------|-------|
| (a) ♂ .. | 158 .. | 57 .. | 22 .. | .. | 90 |

Irides light brown, feet horn, bill greyish.

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|--------|---------------|-------|---------|-------|-------|
| (b) .. | 161 .. | 58 .. | 22 .. | 10 .. | 83 |

Irides light amber, feet horn, bill greyish.

Very few birds were seen as we continued our journey northward from the last camp. In the vicinity of lat. 19° S. the following were identified:—*Amytornis rufa* (Rufous Grass-Wren), *Pardalotus*, sp. (Pardalote), *Malurus assimilis* (Purple-backed Wren), *Sphenostoma cristatum* (Wedgebill), *Oreoica cristata* (Bell-Bird), *Ephthianura tricolor* (Tricoloured Chat), *Petræca plicata* (Pied Robin), *Petræca goodenovi* (Red-capped Robin), *Artamus melanops* (Black-faced Wood-Swallow), *Malurus cyanotus* (White-winged Wren), *Uroaëtus audax* (Wedge-tailed Eagle), *Ptilotis sonora* (Singing Honey-eater), *Ptilotis keartlandi* (Kearland Honey-eater), *Certhionyx variegatus* (Pied Honey-eater), *Collyriocincla*, sp. (Shrike-Thrush).

Measurements of birds collected about lat. 19° S. (4th July):—

***Pardalotus ornatus*—**

| Total length. | Wing. | Tarsus. | Bill. | Tail. |
|---------------|-------|---------|-------|-------|
| 108 .. | 65 .. | 19 .. | 6 .. | 31 |

Irides amber, feet grey, bill dark horn.

* For description of this new bird see p. 274.

Malurus assimilis—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------|---------------|-------|---------|-------|-------|
| ♂ .. | 142 .. | 50 .. | 21 .. | 9 .. | 75 |

Feet dark grey, bill black.

Petræca goodenovii, *Malurus cyanotus*, *Ptilotis heartlandi*, *Sphenostoma cristatum* (Wedgebill), *Ephthianura tricolor*, and *Amytornis rufa* were not seen north of lat. 19° S.

The following species were identified about 30 miles south-west of Newcastle Waters, which is practically the northern limit of the desert country:—*Lalage leucomelæna* (Pied Caterpillar-eater), *Melopsittacus undulatus* (Warbling Grass-Parrakeet), *Calopsittacus novæ-hollandiæ* (Cockatoo-Parrakeet), *Cuculus inornatus* (Pallid Cuckoo), *Chalcococcyx basalis* (Narrow-billed Bronze-Cuckoo). The last two species were fairly numerous, and were travelling southward.

The following birds were identified near Tundi-eji Waterholes (lat. 17° 47' 34" S.):—*Melopsittacus undulatus* (Warbling Grass-Parrakeet), *Calopsittacus novæ-hollandiæ* (Cockatoo-Parrakeet), *Cacatua roseicapilla* (Rose-breasted Cockatoo), *Cacatua gymnopsis* (Bare-eyed Cockatoo), *Cacatua galerita* (White Cockatoo), *Milvus affinis* (Kite), *Haliastur sphenurus* (Whistling Eagle), *Falco lunulatus* (Little Falcon), *Hieracidea orientalis* (Western Brown Hawk), *Astur fasciatus* (Goshawk), *Corvus coronoides* (Crow), *Cracticus nigrigularis* (Black-throated Butcher-Bird), *Myzomela nigra* (Black Honey-eater), *Ptilotis sonora* (Singing Honey-eater), *Acanthogenys rufigularis* (Spiny-cheeked Honey-eater), *Artamus personatus* (Masked Wood-Swallow), *Smicrornis flavescens* (Yellow-tinted Tree-Tit), *Rhipidura tricolor* (Black-and-White Fantail), *Anthus australis* (Pipit), *Mirafrja secunda* (?) (Lesser Bush-Lark), *Tæniopygia castanotis* (Chestnut-eared Finch), *Pomatostomus rubeculus* (Red-breasted Babbler), *Coracina robusta* (Black-faced Cuckoo-Shrike), *Geopelia placida* (Peaceful Dove), *Himantopus leucocephalus* (White-headed Stilt), *Recurvirostra novæ-hollandiæ* (Red-necked Avocet).

These waterholes are situated near the margin of the immense treeless plains that stretch far to the eastward, and are visited by thousands of birds daily, the morning and nightly visits of great flocks of Warbling Grass-Parrakeets being remarkable sights.

Measurements of **Corvus coronoides**, collected at Tundi-eji (13th August):—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------------|---------------|--------|---------|-------|-------|
| Adult ♀ .. | 455 .. | 310 .. | 61 .. | 48 .. | 177 |

Irides white, feet and bill black.

Bird-life was extremely scarce on the great plains to the eastward of Tundi-eji, and only three species were met with—viz., *Mirafrja secunda* (?) (Lesser Bush-Lark), *Cerchneis cenchroides* (Kestrel), *Eupodotis australis* (Bustard).

At Collabirian Creek *Circus assimilis* (Spotted Harrier), *Artamus leucogaster* (White-rumped Wood-Swallow), and *Cracticus picatus*

(Pied Butcher-Bird), were met with for the first time (28th August).

On reaching the coastal range the country became very broken, and at Top Spring, near the head of M'Arthur River, many changes were noticed in the geological formation of the country and in the flora and avifauna.

The following birds were identified near Top Spring (1st September):—*Oreoica cristata* (Bell-Bird), *Petræca picata* (Pied Robin), *Ptilotis sonora* (Singing Honey-eater), *Ptilotis unicolor* (White-gaped Honey-eater), *Entomyza albipennis* (White-quilled Honey-eater), *Myzomela pectoralis* (Banded Honey-eater), *Melithreptus lætior* (Golden-backed Honey-eater), *Melithreptus albigularis* (White-throated Honey-eater), *Tropidorhynchus argenticeps* (Silvery-crowned Friar-Bird), *Ninox occidentalis* (?) (Western Winking Owl), *Ptistes erythropterus* (Red-winged Lory), *Trichoglossus rubritorques* (Red-collared Lorikeet), *Cacatua galerita* (White Cockatoo), *Climacteris melanura* (Black-tailed Tree-creeper), *Artamus minor* (Little Wood-Swallow), *Artamus personatus* (Masked Wood-Swallow), *A. melanops* (Black-faced Wood-Swallow), *Geopelia placida* (Peaceful Dove), *Lophophaps plumifera* (Plumed Bronze-wing Pigeon), *Geophaps smithi* (Naked-eyed Partridge-Pigeon), *Lalage leucomelæna* (Pied Caterpillar-eater), *Coracina robusta* (Black-faced Cuckoo-Shrike), *Corvus coronoides* (Crow), *Sisura nana* (Little Flycatcher), *Poephila acuticauda* (Long-tailed Grass-Finch), *Dacelo cervina* (Fawn-breasted Kingfisher), *Malurus cruentatus* (Red-backed Wren), *Oriolus affinis* (Allied Oriole), *Gymnorhina leuconota* (White-backed Magpie), *Anthus australis* (Pipit), *Neositta*, sp. (Tree-runner), *Cracticus picata* (Pied Butcher-Bird), *Melopsittacus undulatus* (Warbling Grass-Parrakeet), *Calopsittacus novæ-hollandiæ* (Cockatoo-Parrakeet), *Smicrornis flavescens* (Yellow-tinted Tree-Tit), *Collyriocincla woodwardi* (?) (Brown-breasted Shrike-Thrush). The last-mentioned species inhabits the sandstone ranges, and appears to be identical with specimens from similar country in North-West Kimberley.

The following species were identified in the vicinity of M'Arthur River Station (5th September):—*Pæcilodryas cervini-ventris* (Buff-sided Robin), *Dacelo cervina* (Fawn-breasted Kingfisher), *Centropus phasianus* (Pheasant-Coucal), *Ptilotis unicolor* (White-gaped Honey-eater), *Ptilotis flavescens* (Yellow-tinted Honey-eater), *Ptilotis sonora* (Singing Honey-eater), *Entomyza albipennis* (White-quilled Honey-eater), *Myzantha flavigula* (Yellow-throated Miner), *Sisura nana* (Little Flycatcher), *Rhipidura tricolor* (Black-and-White Flycatcher), *Malurus assimilis* (Purple-backed Wren), *Malurus cruentatus* (Red-backed Wren), *Oriolus affinis* (Allied Oriole), *Cuculus inornatus* (Pallid Cuckoo), *Lalage leucomelæna* (Pied Caterpillar-eater), *Geopelia placida* (Peaceful Dove), *Geopelia humeralis* (Barred-shouldered Dove), *Phaps chalcoptera* (Bronze-wing Pigeon), *Lophophaps plumifera* (Plumed Bronze-wing Pigeon), *Milvus affinis* (Kite),

Trichoglossus rubritorques (Red-collared Lorikeet), *Calopsittacus novæ-hollandiæ* (Cockatoo-Parrakeet), *Melopsittacus undulatus* (Warbling Grass-Parrakeet), *Ptilines erythropterus* (Red-winged Lory), *Cacatua roseicapilla* (Rose-breasted Cockatoo), *Cacatua galerita* (White Cockatoo), *Dicaeum hirundinaceum* (Mistletoe-Bird), *Notophox novæ-hollandiæ* (White-fronted Heron).

BORROLOOLA AND DISTRICT.

We arrived at Borroloola early on 8th September, 1911, and remained in the neighbouring country until the middle of March, 1912. The season was a very favourable one for collecting, and, although often engaged upon other work, I had many opportunities for adding considerably to the natural history and botanical collections. Without systematic skin-collecting it was impossible to identify all the species seen, but the following list may be taken as fairly complete:—

Dromæus novæ-hollandiæ (Emu).

Uncommon.

Synæcus australis (Brown Quail).

Very numerous in grassy localities. Nesting season—January, February, and March.

Turnix castanonota (Chestnut-backed Quail).

Fairly plentiful; generally seen in drier localities than those chosen by *Synæcus australis*.

Turnix pyrrhotorax (Red-chested Quail).

This species appears to be very uncommon. I secured one specimen only (27th February), and one set of eggs (2/2/12), which measured—(a) 20 x 16.5, (b) 22 x 17, (c) 21.5 x 17.5, (d) 21.5 x 17.0

Measurements of bird:—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|---|---------------|-------|---------|-------|-------|
| ♀ | 160 | 80 | 21 | 12 | 33 |

Irides whitish, feet pale flesh colour, bill light grey.

Turnix velox (Swift-flying Quail).

Fairly numerous on open plains in February.

Myristicivora spilorrhœa (Nutmeg-Pigeon).

These fine birds were fairly numerous near the river in October, November, and December.

Geopelia humeralis (Barred-shouldered Dove).

Numerous near the river. Eggs were taken in January.

Geopelia placida (Peaceful Dove).

A very common species.

Phaps chalcoptera (Bronze-wing Pigeon).

Fairly numerous in the open forest country near the river.

Geophaps smithi (Naked-eyed Partridge-Pigeon).

Rather uncommon. Generally found in well-grassed, moist localities.

Lophophaps plumifera (Plumed-Pigeon).

Found in the ranges.

Porphyrio melanonotus (Bald-Coot).

Plentiful in the tall grass near the river and swamps.

Podiceps novæ-hollandiæ (Black-throated Grebe).

Uncommon. Eggs were taken on 1st February.

Larus novæ-hollandiæ (Silver Gull).

A few birds were seen on the lower M'Arthur River in October.

Hæmatopus longirostris (Pied Oyster-catcher).

Uncommon; seen near mouth of M'Arthur River.

Lobivanellus miles (Masked Plover).

Small flocks were numerous in the open country in October, November, and December. The nesting season appears to commence in January.

Charadrius dominicus (Lesser Golden Plover).**Ægialitis ruficapilla** (Red-capped Dottrel).

Numerous near the coast.

Numenius cyanopus (Sea-Curlew).

This and the following species were occasionally seen on the lower M'Arthur River.

Numenius variegatus (Whimbrel).**Glottis nebularius** (Greenshank).**Gallinago australis** (Snipe).

I shot a single specimen at Borroloola on 25th December.

Tringa crassirostris (Great Sandpiper).

Fairly numerous on the lower river.

Hydrallector gallinaceus (Comb-crested Jacana).

These strange birds were seen on several lily-covered lagoons, notably Mingara Lagoon, lower M'Arthur River, where two sets of four eggs, in advanced state of incubation, were taken on 8th January from nests built of aquatic plants resting on lily leaves. The illustration and description of nests given in "Nests and Eggs of Australian Birds," Campbell, p. 774, are typical of the nests referred to above.

Measurement of bird collected 24/2/12 :—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------|---------------|--------|---------|-------|-------|
| ♂ .. | 210 .. | 120 .. | 50 .. | 16 .. | 32 |

Irides straw, feet greyish-black; bill whitish, with black tip.

Measurements of a set of eggs :—(a) 30 x 21, (b) 31 x 21, (c) 31 x 21, (d) 32 x 21.

Burhinus grallarius (Stone-Plover).

Fairly numerous on the scrub-covered rises near the river.

Antigone australasiana (Crane).

Occasionally seen near the river lagoons and in the open forest during the wet season.

Eupodotis australis (Bustard).

Arrived a few days after the first flight of locusts (*Locusta danica*) in December, and remained until the end of January.

Ibis molucca (White Ibis).

Fairly numerous. In the dry season they are generally found in the mangroves, where they find abundance of food in the form of small crabs and shell-fish.

Carphibis spinicollis (Straw-necked Ibis).

Several large flocks were seen on 1st October.

Platalea regia (Black-billed Spoonbill).

Numerous near the river and swamps. These and other birds are said to go to some swamps south-east of the M'Arthur River for the nesting season.

Platibis flavipes (Yellow-billed Spoonbill).

Somewhat scarce.

Xenorhynchus asiaticus (Black-necked Stork, or Jabiru).

These very handsome birds were occasionally seen on the saline plains and banks of the lower M'Arthur River. Young birds, about three-parts grown, were seen in October. On 18th February a native brought me two eggs from the same locality.

Measurements of eggs :—(a) 89 x 61, (b) 89 x 61.

Ardea sumatrana (Great-billed Heron).

These solitary birds inhabit the densest mangrove scrub and sheltered inlets on the lower river and islands.

Mesophoyx plumifera (Plumed Egret).

Numerous.

Herodias timoriensis (White Egret).

Numerous.

Notophoyx novæ-hollandiæ (White-fronted Heron).

Fairly numerous. Eggs, in advanced state of incubation, were taken on 30th December from a nest placed in the topmost branches of a dead eucalyptus tree.

Notophoyx pacifica (White-necked Heron).

Uncommon.

Notophoyx aruensis (Allied Egret).

One pair visited a small lagoon near our camp regularly for a few weeks in January. The natives say that these birds are rarely seen.

Butorides stagnatilis (Thick-billed Bittern).

Not uncommon in the mangroves.

Anseranas semipalmata (Pied Goose).

The first arrivals appeared near our camp on 20th January, and remained about the submerged grass country until we left the district. Large flocks were seen flying south-east towards the latter part of the month. According to the natives, looped tracheæ are frequently seen in these Geese. I examined about 10 specimens, only one of which (an old male) showed this form of trachea. In

this case the trachea passed twice down the left pectoral muscle to near the vent before it entered the body. A few parasites (*Mallophaga*) were found on one specimen only.

Nycticorax caledonicus (Night-Heron).

A common bird. The natives say that most of the Herons of all species nest in the mangroves along the Robinson River.

Nettopus pulchellus (Green Goose-Teal).

Found on nearly all the swamps. In February pairs were numerous in submerged open forest country near Borroloola, where they evidently intended to nest. A native brought me three eggs on 3rd March, which were taken from a nest built in the grass near a swamp. Towards the end of March I saw several broods of young birds in a waterhole near the head of the Wickham River.

Measurements of three eggs :—(a) 40.5 x 29, (b) 39 x 29, (c) 38 x 29.5.

Dendrocyena arcuata (Whistling Duck).

Several small flocks were seen in January.

Anas superciliosa (Black Duck).

Seen during October and November

Tadorna rufigerum (White-headed Shieldrake).

Very rarely seen.

Nettion castaneum (Teal).

Uncommon.

Measurement of bird collected 22/11/11 :—

| Total length. | Wing. | Tarsus. | Bill. | Tail. |
|---------------|--------|---------|-------|-------|
| 395 .. | 188 .. | 31 .. | 35 .. | 81 |

Irides reddish, feet grey, bill slate-blue.

Phalacrocorax carbo (Black Cormorant).

A few of these birds were seen near the lower M'Arthur River.

Phalacrocorax sulcirostris (Little Black Cormorant).

Fairly numerous on the tidal part of the river.

Phalacrocorax hypoleucus (Pied Cormorant).

Fairly numerous on the tidal portion of the river—*i.e.*, from Borroloola to the coast.

Plotus novæ-hollandiæ (Darter).

Not uncommon on the upper tidal portion of the M'Arthur River.

Pelecanus conspicillatus (Pelican).

Seen on lower M'Arthur River.

Astur fasciatus (Goshawk).

Uncommon.

Uroaëtus audax (Wedge-tailed Eagle).

Uncommon.

Haliaëtus leucogaster (White-bellied Sea-Eagle).

Occasionally seen about the lower M'Arthur River, where they nest in the tallest eucalypts.

Haliastur girrenera.

A very uncommon bird.

Haliastur sphenurus (Whistling Eagle).

Very numerous during the locust season.

Elanus axillaris (Black-shouldered Kite).

One pair only was seen.

Gypoietinia melanosternum (Black-breasted Buzzard).

Occasionally seen in the open country between Borroloola and Western Creek.

Falco lunulatus (Little Falcon).

Very rarely seen.

Hieroidea orientalis (Western Brown Hawk).

Uncommon.

Cerchneis cenchroides (Kestrel).

Uncommon.

Ninox ocellata (Marbled Owl).

Only one pair seen.

Strix delicatula (Delicate Owl):

Uncommon.

Trichoglossus rubritorques (Red-collared Lorikeet).

Very numerous in September, during the flowering of the red-bean trees.

Calyptorhynchus macrorhynchus (Great-billed Cockatoo).

Occasionally seen in small flocks from September to March.

Cacatua galerita (White Cockatoo).

Fairly numerous.

Cacatua roseicapilla (Rose-breasted Cockatoo).

Large numbers arrived early in February, and immediately commenced clearing out hollows for nesting.

Calopsittacus novæ-hollandiæ (Cockatoo-Parrakeet).

Uncommon.

Ptilistes erythropterus (Red-winged Lory).

Three nestlings were brought to me by a native on 9th September. On 18th February the same man brought in three eggs.

Platycercus browni (Smutty Parrakeet).

A few pairs were seen in the sandstone ranges near Western Creek, about 18 miles south of Borroloola.

Ægotheles novæ-hollandiæ (Owlet-Nightjar).

Uncommon.

Eurystomus pacificus (Dollar-Bird):

A very common species.

Alcyon pulchra (Purple Kingfisher).

Fairly numerous along the banks of M'Arthur River.

Dacelo leachi (Leach Kingfisher).

Uncommon. Found in the open forest with *H. pyrrhopygius* and *Dacelo cervina*.

Dacelo cervina (Fawn-breasted Kingfisher).

Uncommon.

Haleyon pyrrhopygius (Red-backed Kingfisher).

Uncommon. Found in the open forest country.

Haleyon macleayi (Forest Kingfisher).

A very uncommon species ; seen at Mingara Lagoon.

Eurostopus argus (Spotted Nightjar).

Fairly numerous on the scrub-covered, stony ridges. A single egg is laid on the stony ground ; no nest is formed. I frequently heard the peculiar calls of these birds on the overland trip, but I did not see any birds until we reached the M'Arthur River district. The food consists principally of night-flying *Coleoptera*.

Measurements of an egg taken 29/12/11 :—33.5 x 23.5.

Cuculus inornatus (Pallid Cuckoo).

A few birds were seen near Borroloola on 28th January.

Eudynamis cyanocephala (Koel).

On 2nd February I took an egg of this species from a nest of *Coracina robusta* containing two eggs. Measurements of egg :—34.5 x 22.0.

Scythrops novæ-hollandiæ (Channelbill).

Very uncommon ; seen in December, January, and February. The fruit of the wild fig is eaten readily by *Scythrops*, *Chlamydodera nuchalis*, *Eudynamis*, and *Tropidorhynchus argenteiceps*.

Centropus phasianus (Spur-footed Cuckoo).

A common species in the coarse grass near the river and creeks. Two sets of eggs, each containing three, were taken on 29th December and 23rd February, and a set of four eggs on 25th January. All three were open nests, built of leafy eucalyptus twigs, lined with detached eucalyptus leaves, and situated in large tussocks of grass, about 18 inches from the ground. Their food consists of grass seeds and insects (principally *Coleoptera*). Several specimens examined were free from external parasites.

Pitta iris (Rainbow Pitta).

On 24th January a native brought in an egg that appeared to be referable to this species. On 30th January the same boy brought in two sets (two fresh eggs in each) of the same kind, telling me at the same time that he found the eggs in grass nests, built on the ground near tussocks of grass. Beyond learning that the eggs were laid by "Chookie-chookies," I could get no further information from him.

Micræca assimilis (?) (Lesser Brown Flycatcher).

Uncommon. Several nests containing young birds were found in September.

Gerygone albigularis (White-throated Fly-eater).

Very uncommon.

Measurements of bird collected 22/11/11 :—

| Total length. | Wing. | Tarsus. | Bill. | Tail. |
|---------------|-------|---------|-------|-------|
| 215 | 54 | 15 | 12 | 40 |

Irides red, feet grey, bill black.

Pseudogerygone lavigaster (Buff-breasted Fly-eater).

Seen in the mangroves, lower M'Arthur River.

Pœcilodryas cerviniventris (Buff-sided Robin).

Found in thick scrub and timber in sheltered localities, generally near water.

Measurements of birds (2/10/11) :—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|-------|---------------|-------|---------|-------|-------|
| (a) ♀ | 140 | 78 | 19 | 12 | 68 |
| b ♂ | 170 | 86 | 21.5 | 11.5 | 73 |

Irides umber, feet and bill black.

Pœcilodryas pulverulentus (White-tailed Robin).

This species is confined to the dense mangrove belt along the lower reaches of the river. The food consists chiefly of small mollusca and crustacea.

Petrœca picata (Pied Robin).

Uncommon. A nest containing two young about three weeks old was found on 5th January. The nest was built on a horizontal branch of a stunted melaleuca tree, 8 feet from the ground.

Rhipidura isura (Northern Flycatcher).

Uncommon; generally found in the same localities as *Sisura nana* and *Pœcilodryas cerviniventris*.

Rhipidura tricolor (Black-and-White Fantail).

This familiar and widely distributed species is met with frequently in all localities.

Myiagra rubecula (Leaden Flycatcher).

Very uncommon.

Myiagra concinna (Blue Flycatcher).

Uncommon; generally found in the mangroves or in open eucalyptus forest near the river.

Myiagra latirostris (Broad-billed Flycatcher).

Seen only in the mangroves along the banks of the lower M'Arthur River.

Sisura nana (Little Flycatcher).

I found these birds only in sheltered localities near the river, creeks, and swamps, generally amongst tall melaleuca trees.

Piezorhynchus nitidus (Shining Flycatcher).

These beautiful birds live entirely in the densest mangrove belts, obtaining their food (small mollusca and crustacea) on the mud and mangrove roots at low tide.

Coracina robusta (Black-faced Cuckoo-Shrike).

Noted as a foster-parent of *Eudynamis cyanocephala*.

Coracina hypoleuca (White-bellied Cuckoo-Shrike).

An uncommon species.

Lalage tricolor (White-shouldered Caterpillar-cater).

Numerous in November and December.

Pomatostomus rubeculus (Red-breasted Babbler).

Fairly numerous. One set of eggs was taken on 26th January.

Malurus coronatus (Purple-crowned Wren).

This is a very uncommon species, found in the densest thickets and tall grass near the river and larger creeks. I was unable to secure a male, and had considerable difficulty in getting a single female.

Malurus dulcis (Lavender-flanked Wren).

These Wrens live only in the high sandstone country near Borroloola, where they are fairly numerous.

Malurus cruentatus (Red-backed Wren).

A common species, generally found in long grass in low country, but occasionally on the larger creeks near the ranges. The nesting season extends from October to the end of February. The nests are generally built in the grass, about 18 inches from the ground; rarely in bushes.

Amytornis woodwardi (?) (White-chested Grass-Wren).

A species of Amytornis is fairly numerous amongst the porcupine-grass and rocks in the ranges near Borroloola, but I was unable to secure specimens, although I made several attempts to do so. Several nests, probably referable to this species, were found, all of which were of the same type—namely, covered in, rather closely woven structures, resting on the top of porcupine-grass. *Malurus dulcis* inhabits the same class of country.

Artamus leucogaster (White-rumped Wood-Swallow).

A small flock was seen on 20th December.

Gymnorhina tibicen (Black-backed Magpie).

A somewhat uncommon bird.

Measurements of birds:—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|---------------------|---------------|--------|---------|-------|-------|
| (a) ♀ (24/11/11) .. | 373 .. | 227 .. | 54 .. | 50 .. | 138 |

Irides sienna, feet dark grey, bill bluish-grey with black tip.

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|-------------------|---------------|--------|---------|-------|-------|
| (b) ♀ (3/2/12) .. | 388 .. | 237 .. | 50 .. | 53 .. | 133 |

Irides brown, feet blackish, bill slate-blue with black tip.

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|--------------------|---------------|--------|---------|-------|-------|
| (c) ♂ (28/1/12) .. | 424 .. | 262 .. | 56 .. | 63 .. | 141 |

Irides sienna, feet black, bill white with black tip.

Oreocia cristata (Bell-Bird).

These birds were found only on the dry stringybark (*Eucalyptus*) ridges. A nest, built of bark and leaves and lined with grass, was found in a fork of a small eucalyptus sapling on 6th January; it contained, besides two fresh eggs, about one dozen living larvæ of a moth (*Spilosoma*, sp.) It is not uncommon to find the larvæ of

Spilosoma obliqua in the nests of *Oreoica cristata* in Victoria, but it is somewhat remarkable to find larvæ of a very closely allied species in the nests of the Northern Territory birds.

Craicticus nigrigularis (Black-throated Butcher-Bird).

Uncommon.

Measurements of two birds from one brood, about four months old (28/1/12):—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------|---------------|-------|---------|-------|-------|
| ♂ .. | 336 | 163 | 38 | 51 | 135 |
| ♀ .. | 327 | 161 | 38 | 51 | 135 |

Irides dark umber, feet light grey, bill slate-blue with black tip.

Pachycephala falcata (?) (Northern Thickhead).

Occasionally seen on a dry, scrubby ridge near the river. I took a set of two eggs from a nest situated in a low bush (*Calycotrix microphylla*) that is, I think, referable to this species.

***Neositta*, sp.**

Occasionally seen in parties of from four to nine birds.

Climacteris melanura (Black-tailed Tree-creeper).

Occasionally seen in the open forest country.

Measurements:—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------|---------------|-------|---------|-------|-------|
| ♂ .. | 180 | 93 | 23 | 21 | 73 |

Irides umber, feet and bill black.

Dicæum hirundinaceum (Mistletoe-Bird).

A common species wherever *Loranthus* (mistletoe) is found.

Pardalotus uropygialis (Chestnut-rumped Pardalote).

An uncommon species.

Melithreptus albigularis (White-throated Honey-eater).

Uncommon.

Melithreptus lætior (Golden-backed Honey-eater).

Occasionally seen and heard on the high sandstone country.

Myzomela erythrocephala (Red-headed Honey-eater).

These birds inhabit the mangroves along the banks of the lower M'Arthur River.

Myzomela pectoralis (Banded Honey-eater).

An uncommon species near Borroloola, but plentiful near the Roper River in April.

Glycyphila fasciata (White-fronted Honey-eater).

The covered bark nests of this common species are generally built on slender branches overhanging water. The nesting season is December, January, and February.

Conopophila rufigularis (Red-throated Honey-eater).

Very plentiful in the early part of October. Two eggs were taken on 2nd February from a nest built about 35 feet from the ground in a white gum (*Eucalyptus*). The bulk of the nest was built of fine

pieces of bark, closely woven together. The outside was covered with spider-web and the inside lined with rootlets obtained from a nest of *Rhipidura tricolor*.

Stigmatops ocularis (Brown Honey-eater).

Numerous in September.

Ptilotis flavescens (Yellow-tinted Honey-eater).

A fairly common species.

Measurements of bird collected 21/11/11 :—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------|---------------|-------|---------|-------|-------|
| ♂ .. | 156 .. | 78 .. | 18 .. | 13 .. | 65 |

Irides dark umber, feet grey, bill black.

Ptilotis unicolor (White-gaped Honey-eater).

Fairly plentiful. Found in sheltered localities near water. Two partly built nests were found on 10th March, in "ebony trees," (?) about 15 feet from the ground.

Entomyza albipennis (White-quilled Honey-eater).

Fairly numerous.

Tropidorhynchus argenteiceps (Silvery-crowned Friar-Bird).

Uncommon. Appear to frequent the ranges more than the lower country.

Philemon sordidus (Little Friar-Bird).

Numerous in all localities.

Mirafra secunda (?) (Lesser Bush-Lark).

Very numerous on the open grass plains near Borroloola. Young birds flying on 27th February.

Measurements of bird collected 27th February :—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------|---------------|-------|---------|-------|-------|
| ♀ .. | 142 .. | 72 .. | 22 .. | 12 .. | 49 |

Irides light umber, bill greyish-brown, feet flesh colour.

Stictoptera bichenovii (Bicheno Finch).

Found in the same localities as *S. annulosa*, which species they closely resemble in habits, though they do not appear to fraternize.

Stictoptera annulosa (Black-ringed Finch).

Generally found near the river in tall grass and low bushes in parties of from 6 to 12 birds. The nesting season commences in January.

Poephila acuticauda (Long-tailed Grass-Finch).

Uncommon.

Poephila personata (Masked Finch).

More frequently met with than *P. acuticauda*. In April these birds were nesting very freely in the Roper River country. The nests are nearly always built in one of the following positions—(a) on termites' nests, (b) on bare ground at the base of termites' nests, (c) in tussocks of grass at the base of termites' nests, (d) rarely in shrubs growing through or against termites' nests. I cannot recollect having seen a single nest built anywhere but in close

proximity to termites' nests, but a reliable ornithologist informed me that he found several nests near Pine Creek in the grass, and that he had not noticed any partiality on the part of these Finches for termites' nests.

Measurements of bird collected at Borrooloola, 21/11/11:—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|------|---------------|-------|---------|---------|-------|
| ♂ .. | 133 .. | 58 .. | 15 .. | 10.5 .. | 54 |

Irides red, feet coral pink, bill yellow.

Poephila gouldiæ (Gouldian Finch).

On 8th February I noticed a pair building their nest in a hollow branch of a eucalyptus tree about 30 feet from the ground. These were probably new arrivals in the district, and would have been followed by others. However, as I was not in the locality again, I was unable to make further observations.

Neochmia phaeton (Crimson Finch).

Generally found in tall grass near the river. The nests are built of bark and broad leaves of grass, lined with feathers and portions of grass-seeds, usually placed in forks or under loose pieces of bark from 8 to 20 feet from the ground.

Oriolus affinis (Northern Oriole).

Uncommon.

Chlamydodera nuchalis (Great Bower-Bird).

A fairly common bird in all localities. The bowers are generally built under or near isolated shady trees or bushes, and are made more conspicuous by the piles of bleached land-shells at each end of them. January and February appear to be the nesting months.

Corvus coronoides (Crow).

Fairly numerous.

Measurements of bird collected 20/11/11:—

| | Total length. | Wing. | Tarsus. | Bill. | Tail. |
|--|---------------|--------|---------|-------|-------|
| | 357 .. | 315 .. | 61 .. | 56 .. | 189 |

Irides umber, feet and bill black.

Crop contents—seeds and *Coleoptera* (beetles).

SIR EDWARD PELLEW ISLANDS.

North Island differs but little in its geological formation, flora, and avifauna from the sandstone ranges in the vicinity of Borrooloola. An abundant supply of fresh water is to be found in a small marshy flat at the head of Cabbage-tree Cove, and plenty of cover in the mangroves fringing the coast and in the dense *Acacia* and *Grevillea* scrub on the higher ground, where one might expect to find birds in evidence; but, excepting certain species, we saw few during our brief visit. The following species were identified (18th October):—*Stigmatops ocularis*, *Glycyphila fasciata*, *Philemon sordidus*, *Ptilotis sonora*, *Micræca flaviventris*, *Eurystomus pacificus*, *Geopelia humeralis*, *Geopelia placida*, *Coracina robusta*, *Ptilistes erythropterus*, *Stictoptera annulosa*, *Stictoptera bichenovii*, *Myiagra concinna*, *Piezorhynchus nitidus*, *Megalurus galactotes*, *Turnix*, sp., *Cuculus inornatus*, *Dacelo cervina*, *Pandion leucocephalus*, *Ardea*

sumatrana, *Pelecanus conspicillatus*, *Tringa crassirostris*, *Sterna sinensis*.

On 19th October a visit was paid to a low, waterless island of a few acres in extent lying between Vanderlin's Island and Observation Island. This island is composed almost entirely of broken masses of sandstone, with just sufficient sand and broken coral to afford anchorage for the roots of the stunted scrub and grass. As we approached the island it became evident that numbers of Terns were nesting. A brief search revealed many nesting-places of Panayan Terns (*Sterna anæsthesia*) under ledges of rock. In one instance two eggs were found in one nesting-place; but in all others the usual setting, one egg, was found. One egg only was found under a bush; all the others were laid on the sand or coral under ledges of rock. The number of birds in this "rookery" was very roughly estimated at about 1,000. Measurements of eggs:—(a) 43 x 30, (b) 51 x 33, (c) 49 x 33, (d) 49 x 34.5, (e) 45 x 34, (f) 49 x 33. The following birds were identified:—*Stigmatops ocularis*, *Zosterops lutea*, *Geopelia humeralis*, *Centropus phasianus*, *Pandion leucocephalus*, *Sula leucogaster*, *Sterna sinensis*, *Orthorhamphus magnirostris*. The presence of such birds as *Megalurus*, *Centropus*, and *Geopelia* on this barren and inhospitable little island seems to show that they work out to the northern end of Vanderlin's Island from the mainland through the numerous islands to the eastward, thus accomplishing in short flights a journey that would be a severe trial for the two former, at any rate, did they choose the more direct course—i.e., across the strait between the southern end of the island and the mainland.

Field Ornithology in South Australia.

By CAPT. S. A. WHITE, M.B.O.U., ADELAIDE.

KANGAROO ISLAND.

ONE very hot day in November, 1911, my wife and I landed at Kingscote, Kangaroo Island. (I had promised Mr. G. M. Mathews that we would work the island thoroughly.) Next morning we began to travel westward. The horse feed made a big load. (The country does not produce much grass, and the native scrub is not fit to support horses or cattle.) Following a metal road for some distance, with a species of eucalypt growing on either side, we passed some mills where oil was being distilled from the gum-leaves. Leaving the macadam behind, we plunged into a sandy track, and soon lost sight of the eucalypts. We passed over a "sour" piece of country, leaving Koh-i-noor Hill, over which the telegraph-line is carried to Cape Borda, on the left. We struck out for the head reaches of the Cygnet River, and came to the crossing known as "Long Waterhole." We formed our camp in the bend of the river, and here our observations began.

The first bird to attract our attention was the Kangaroo Island Black Cockatoo (*Calyptorhynchus whiteæ*, Mathews, *vide Austral Avian Record*, vol. i., part 2, p. 35). A pair had selected a hollow in the bole of a high gum growing in the bed of the creek. The birds flew to and from their feeding ground with much noise, and when the nesting-place was approached they swooped down, uttering fiendish screams. Some fair-sized timber along the river afforded shelter for many birds. Coming from the topmost branches of the trees were the sharp call-notes, "Be quick, be quick," of a Pardalote (*Pardalotus subaffinis*, Mathews, *vide* "Reference-list Australian Birds," p. 388). These birds, although not numerous, we subsequently found to be dispersed over the whole of the island. A far more numerous bird was the Kangaroo Island Crescent Honey-eater (*Meliornis halmaturina*, A. G. Campbell). The liquid call of this bird came from the brush-wood, wherever it was dense enough to conceal them. When alarmed it mounted to the highest twig of the thicket at intervals, to dart down again with lightning speed, calling loudly the while. In similar localities we found the South Australian White-bearded Honey-eater (*Meliornis subassimilis*, Mathews, "Reference-list Australian Birds," p. 415). We met with the Kangaroo Island Crow-Shrike (*Strepera halmaturina*, Mathews, "Reference-list Australian Birds," p. 444). Here they were in pairs and very shy, showing the greatest cunning in keeping out of our way. The graceful little Kangaroo Island Spinebill (*Acanthorhynchus halmaturina*, Campbell) was often observed probing the heath-like flowers with its long, slender bill, hanging sometimes by one foot, with head stretched downwards, to reach some blossoms, or clinging to the large spike-like flower-heads of the yacca trees. The harsh cry of the Kangaroo Island Red Wattle-Bird (*Anellobia halmaturina*, Mathews, *Austral Avian Record*, vol. i., part 4, p. 101) was heard, and we noticed that these birds were not nearly so numerous as on the mainland.

After working the country round for some distance we harnessed the horses, and moved on to Bark Hut, a pretty valley sloping towards the river, clothed with bushes and trees. It was here that we came in touch with that lovely bird the Kangaroo Island Crimson Parrot (*Platycercus melanoptera*, North). These birds were fairly numerous, and we often flushed them from the ground in the mornings and evenings. They seemed to be hunting for food among the low shrubs. From here we drove on towards the north coast, passing through a desert yacca* country, poor in soil and scrub. Birds were few, and those we met with were of species mostly found in poor country. Just after striking the track, which ran along the north coast (for we had come across country after leaving the Cygnet and struck the track midway between Stokes Bay and Middle River), we saw a domestic cat which had become wild—an enemy to birds. After driving along

* Grass-tree (*Xanthorrhœa*).

a high ridge, from which we obtained a view of the sea, for some time, we descended a steep hill into the valley through which Middle River flowed. After driving along the track, which followed the river almost to its mouth, for some distance, we called a halt, and took up our abode at Snelling's Cove. This was the old camping-ground of the Union expedition in 1906, and it was here that members did so much good work. We soon began tramping over the steep, rugged hills in quest of birds. We followed the river where it flowed through the flat, and still further up, through a wild and rocky country, till the renowned Strepera Falls (named by a member of the Union in 1906) were reached. Among the bracken and tangled vegetation the dainty little Kangaroo Island Blue Wren (*Malurus ashbyi*, Mathews, *vide* "Reference-list Australian Birds," p. 358) was fairly numerous. They were often seen hopping over the dead leaves and stones amidst the undergrowth, in search of insects. At times the male birds hopped on to a dead twig and uttered a pleasing song.

The bright plumage of the Kangaroo Island Crimson Parrot (*Platycercus melanoptera*, North) was again met with. The loud and clear note of the Kangaroo Island Crow-Shrike, *Strepera halmaturina*, Mathews) went echoing up the deep ravine through which the river passed. The habits of this bird seemed to resemble those of other members of the genus. They hunted among the leaves and fallen timber for worms, grubs, and insects. They were shy, and on the least alarm flew off to a distance, uttering the loud piping call so familiar to those who have spent much of their time in the bush. Among the timber an occasional glimpse was obtained of the Kangaroo Island Scarlet-breasted Robin (*Petræca samueli*, Mathews, *vide Austral Avian Record*, vol. i., part 4, p. 89). I thought that this bird differed from the mainland species directly I procured a specimen. (One cannot say that these little birds are numerous on the island, but this is owing, no doubt, to their being short-flighted and local. Many must be destroyed by the disastrous fires which sweep from coast to coast only too frequently.) A Pardalote (*Pardalotus affinis*) was met with here among the timber. The Wedge-tailed Eagle (*Aquila audax*) was also seen soaring high above the trees. At the river mouth both the Little Black Cormorant (*Carbo sulcirostris*) and the Little Cormorant (*Carbo melanoleucus*) were observed perched on dead trees where they could get a good view of the deep reaches. We met with the Southern White Cockatoo (*Cacatoes rosinae*, Mathews, *vide Austral Avian Record*, vol. i., part 2, p. 36) here, but not in numbers.

We climbed the high range and followed the track (which leads to Cape Borda) for a considerable distance, then struck into the interior, and returned to headquarters through the thick scrub, of stunted oak and *Melaleuca*. Amidst this stunted vegetation we met with the Southern Tawny-crowned Honey-eater (*Glyciphila braba*, Mathews, *vide Austral Avian Record*, vol. i., part 2, p. 49). Their mournful call was often heard, but the birds

were seldom seen, for they are very shy. We found one of their cup-shaped nests placed in a low bush, close to the ground. It contained two eggs. The ground colour of the shells was pinkish-white, with small spots of dark red, markings predominating on the larger end, almost forming a zone. The nest was composed of grass and leaves and lined with flower-heads. (This lining of flower-heads is characteristic of *G. melanops*.) The deep cooing of a Bronze-Pigeon (*Phaps*) was heard, but we did not procure a specimen of the bird, and were not sure of its identity. We met with the Kangaroo Island Striated Tit (*Acanthiza whitei*, Mathews, *Austral Avian Record*, vol. i., part 2, p. 44) in fair numbers. These birds kept to the big timber, and travelled about in small parties of from two or three to a dozen. We came upon the shy Kangaroo Island Grass-Wren (*Hylacola halmaturina*, Mathews, "Reference-list," p. 333). They were not nearly so plentiful on the north side of the island as we afterwards found them to be on the south side. The most numerous of all species on the island was the Kangaroo Island Brown Tit (*Acanthiza zietzi*, North). We found this useful little bird in all localities, hopping about mostly in the undergrowth, uttering a twittering-like note as it invaded nooks and corners for spiders and insects.

Early one morning, mounted on draught horses, we made a start for the celebrated "Tin Hut," which is situated in the centre of the island. Having led our horses up the steep and rocky mountain side, we struck and crossed some yacca country, in places covered thickly with bull-oak. The country was dreary and poor. Few birds were seen or heard. About mid-day we came to Starvation Creek—a fair-sized stream fringed on either bank with bright-green rushes and thick undergrowth. Here the birds were more plentiful; the sharp, piercing notes of the New Holland Honey-eater and Kangaroo Island Crescent Honey-eater could be heard all along the creek. The bed of the creek was treacherous, and we followed its course for several miles in search of a crossing. When we halted for a late meal rain set in, and we decided to return to the coast. Just after turning north we came upon a small party of Black Cockatoos (*Calyptorhynchus whiteæ*). These quaint birds occupied our attention for some little time. When we resumed our journey I drew the guide's attention to the fact that he was heading nearly west, instead of north-east. The sky was overcast, and a light rain falling. The guide was sure that he knew the lay of the country, so I let him go his own way. All the afternoon we forced a passage through the thick scrub, which tore our clothing and made travelling anything but pleasant. Towards dark we entered deep gullies and high stony hills, steep, and covered with timber. The guide now admitted that he had made a mistake, and that we would be approaching the coast a long way to the west of where we wished to come out. We were obliged to dismount and lead our horses. It was with the greatest difficulty that the animals followed us down almost perpendicular hillsides, among shifting stones, and scrambled up

slopes. At length we reached the coast-line below Western River, and slowly picked our way east for home. On the stillness of the night the far-off call of the Boobook Owl came floating down to us. We were glad indeed when we saw lights ahead.

After "working out" the bird-life for many miles around, we returned to the starting place, reaching Kingscote the day before the boat sailed. The day of waiting was spent on Kingscote or Beatrice Spit, which consists of a tongue of sand from a mile to a mile and a half in length and a few yards in width. The highest part of the Spit is only a few inches above high water mark. Some salt-bushes grew here, and among them we saw the Kangaroo Island Grass-Bird (*Megalurus halmaturinus*, Mathews, *vide Austral Avian Record*, vol. i., part 2, p. 43). The birds kept close to the ground when alarmed, passing from bush to bush like mice. In some instances birds allowed the bush which formed their cover to be trampled to pieces before they shot out. When not alarmed, and not aware of the presence of man, they perched on the topmost twigs of a salt-bush, and uttered a pleasing song, resembling much that of the *Maluri*. (I remember landing on this spit, from my late father's yacht, in 1879, and the sight which I saw impressed itself vividly upon my memory. The whole of the Spit above high water mark was covered with sea-birds' eggs, and it was with the greatest difficulty that one could walk without stepping on the eggs.) A few Terns and Gulls wheeled around us as we landed. About the middle of the Spit a sad sight met our eyes. Large clutches of Cormorants' eggs lay bleached and white in last year's nests, and the headless bodies of the birds were scattered around. Next morning we caught the boat for Port Adelaide.

Mr. G. M. Mathews was anxious that we should complete our work on Kangaroo Island. On 10th April, 1912, we were once again in the township of Kingscote. We arranged for stores, transport, &c., and next morning started "out back." We took the same route, to the west, as on the first trip for 8 or 9 miles, and then travelled off to the south and climbed up the steep Koh-i-noor Hill. We found ourselves on the backbone or central ridge of the island, some 700 or 800 feet above the sea. On this central ridge most of the creeks had their source, and they could be seen flowing on one hand to the north coast and on the other to the south coast. Travelling on, we were soon amidst a succession of steep hills, for this high central ridge was cut through by many gullies, forming the feeders and watercourses which ran to the coast on either hand. We had surmounted only a few of the hills when we discovered that we had a jibbing horse in our team. His mate had to pull the trap to the top of each hill; the jibber would work only where the going was easy. At nightfall we camped in a deep gully, now known as "Jibbing Horse Creek."

Early next morning I walked for a few miles around the camp,



Scene, Centre Kangaroo Island.

FROM A PHOTO. BY (CAPT.) S. A. WHITE.

and found bird-life scarce. Nearly all the birds I saw were Honey-eaters. After breakfast we yoked up our team, but had not gone far when the jibbing horse started his pranks. I sent the lad off with him to Kingscote—a bare-back ride of over 30 miles through rough country, with orders to return with another horse, and we spent the greater part of the next two days observing birds in the surrounding country. We found the few species (mostly Honey-eaters) which exist in the centre of the island confined to the creeks. An interesting bird, which came under our notice for the first time, was the Kangaroo Island Fire-tailed Finch, which Mr. Mathews has described as *Zonæginthus samueli* (*vide Austral Avian Record*, vol. i., part 4, p. 102). Amidst the thickest of the undergrowth, generally in damp localities, the mournful call of this bird could be heard. Here, too, we came in touch with the Kangaroo Island Red Wattle-Bird (*Anellobia halmaturina*, Mathews, *Austral Avian Record*, vol. i., part 4, p. 101), which seemed to be sparsely distributed over the island. We found the Southern White-bearded Honey-eater (*Meliornis subassimilis*, Mathews) to be fairly abundant here. In the deep gullies, amidst the thick undergrowth, the Kangaroo Island Crescent Honey-eater (*Meliornis halmaturina*) was present in fair numbers. On the third day a fresh horse arrived, and, after giving it a rest, we harnessed it up with the other and began to travel steadily through the

bush. Now and again a "goanna" stared at us with surprise from some fallen tree or rock, and at our approach went scampering off to hide beneath the fronds of a wide-spreading yacca. Poor, stunted gum-trees were met with, and soon afterwards we came upon "Tin Hut." Leaving the central ridge, we struck off to the south through a dense mass of bull-oak and other scrub to Edwards Lagoon, thence to Kangaroo Lagoon, which we made our headquarters for a few days.

Kangaroo Lagoon, although much smaller than Edwards Lagoon, was a fine sheet of water, surrounded by a thick fringe of rushes, and, outside them, a thick mass of broom, desert oak, and other shrubs, with patches here and there of stunted eucalypts. After the dry season the water had receded past the fringe of rushes, and it was with the greatest difficulty that the horses could be got out to drink, for they sank knee-deep in the soft mud through which the rushes grow. Strange to say, few water birds were found on this lagoon. Some Black Duck (*Anas superciliosa*), Australian Shieldrake (*Tadorna tadornoides*), and Grey Teal (*Nettion gibberifrons*), one pair of eastern Bald-Coots (*Porphyrio melanonotus*), a few White-faced Herons (*Notophoxyx novæ-hollandiæ*). In the scrub around the lagoon was a colony of Crimson Parrots (*Platycercus melanoptera*), many of them being immature birds, presenting that well-known patchy appearance of other members of the genus in their early stages of life, a few crimson feathers appearing amidst the dark green plumage. Here, amidst the thick undergrowth, we found the Kangaroo Island Spinebill (*Acanthorhynchus halmaturinus*, A. G. Campbell), the Kangaroo Island Crescent Honey-eater (*Meliornis halmaturina*, Campbell), and the White-bearded Honey-eater (*Meliornis novæ-hollandiæ*). One evening my wife drew my attention to a bird which was hawking round the camp, and which we at first took to be a night-bird. It darted into a bush and scattered a number of small birds which were roosting. On procuring the bird in question we found it to be an *Accipiter*—a female—of strikingly small dimensions, smaller than any male I had ever seen. It was near this lagoon that the last specimen of the Kangaroo Island Emu was seen. We kept a sharp look-out for remains, but none was seen.

Finishing up our work at the lagoon, we headed for the south coast. Friends at Kingscote had doubted whether we could force a passage through the dense scrub. At first we followed the dim trace of a track made by a survey party when bringing up stores from the coast, but that was soon lost, and we forced our way through a high and entangled scrub, having to use the axe to help the conveyance out of difficulties. At times we emerged into more open country covered with yacca trees, but all the time we were gradually descending. We halted under the shadow of Mount Stockdale. We were off our course, having been compelled to make so many twists and turns to avoid some of the worst obstacles. After consulting the map, we found that we

were between Mounts Stockdale and Taylor, so we took a more south-westerly course, and it was not long before we came out on a patch of country which had been lately cleared by fire. It was here that we came upon the Kangaroo Island Ground-Wren (*Hylacola halmaturina*, Mathews, "Reference-list of Australian Birds," p. 333). These shy little birds were fairly plentiful, and specimens were often seen darting over the open ground between the bushes, uttering a chattering call. Few other birds were seen. Fires had cleared much of the country. We now found ourselves amid innumerable swamps and soft patches. This was the watershed of the upper North-East River. After making progress through a rough locality, where no birds were to be seen, we crossed with great difficulty (owing to the soft nature of the ground) a branch of the North-East River, and plunged into a thick scrub of desert oak (this was on our second day amidst this wild country) and other shrubs, from 8 to 10 feet high. It was with the greatest trouble that we induced our horses to crash through this mass of vegetation. After a few miles of steering by the sun (we were shut in all round by this dense scrub), we at last came out upon more open ground, which at some time had been swept by fire. We traced the course of the river, marked by the dark foliage of the sugar gums. A few birds now came under notice. The shy Kangaroo Island Scrub-Wren (*Hylacola halmaturina*) was seen. The Large-billed Brown-headed Honey-eater (*Melithreptus magnirostris*, North) was moving about in large parties of from 20 to 30 individuals. Among the shoots of the gum-trees Large-billed Honey-eaters were moving with great animation in search of insects. When one bird broke away from a party and flew to a neighbouring sapling, calling loudly, the others would follow in quick succession. Mr. Robert Zietz, of Adelaide Museum, brought this bird to light some few years ago, when visiting Kangaroo Island in company with the late Dr. Angove.

We reached the track on the south coast not a mile from the spot for which we were heading. Here we picked up fresh supplies, which had been sent on from Kingscote. Crossing the river beyond Karatta, we pitched our tent on the slope of a hill, and, fortunately, had things snug when a steady rain set in. The rain continued all night and part of the next day. When the sky cleared we moved afield, and it was not long before we found that this was a favoured spot for bird-life. In open patches of the valley through which the river flowed, and among the fallen timber where the grass had flourished, we found small parties of Crimson Parrots (*Platycercus melanoptera*) feeding on the grass seeds. A few Black Cockatoos (*Cacatoes whiteæ*) were heard screeching, and for the first time we saw the Kangaroo Island Glossy Cockatoo (*Calyptrorhynchus halmaturinus*, Mathews, "Reference-list Birds of Australia," p. 263). Only a pair was observed. The birds came into the timber one evening to roost. They were easily identified on the wing by their small size in comparison with the commoner species, and their cry was much

feebler and less discordant. (From all appearances these birds are becoming rare, and they seem to keep to the western end of the island.) Here we saw a fair number of the Kangaroo Island Scarlet-breasted Robin (*Petræca samueli*, Mathews, *Austral Avian Record*, vol. i., part 4, p. 89).*

One evening we watched a party of Honey-eaters hunting winged insects. They proved to be *Ptilotis cratitia*, but, strange to say, more than one of the mature birds was adorned with wattles that were nearly white. A fair number of Island White-backed Magpies (*Cracticus leuconotus*) were seen, and a few specimens of the Kangaroo Island Raven (*Corvus halmaturinus*, Mathews, "Reference-list Birds of Australia," p. 443). Nearly all the Honey-eaters already mentioned were found in this spot. We worked on towards Rocky River, examining much of the country on each side; but, as the season seemed to be breaking, and rain setting in, we turned our horses' heads homewards. This time we followed the south coast, and passed through much poor country. We camped at the Eleanor River, which proved unproductive. On we went, passing Lake Ada, a pretty pond of water fringed with dark tea-tree. We made a camp at Birchmore's Lagoon and met with a few interesting birds, amongst them being the Kangaroo Island Grass-Bird (*M. halmaturinus*, Mathews, *Austral Avian Record*, vol. i., part 2, p. 43). These birds were in large parties (many being immature), and were hopping about on the shores of the lagoon, some distance from any cover. Close to the edge of the water we saw large parties of the White-eye which Mr. A. G. Campbell named some time ago *Zosterops halmaturina*. In the low scrub, a short distance from the lagoon, we observed a number of Kangaroo Island Scrub-Wrens (*Sericornis ashbyi*, vide Mathews, "Reference-list Birds of Australia," p. 356). We passed through poor sandy country till the Cygnet River was reached, when a change came over the scene; comfortable homesteads, with neat gardens, eucalyptus oil factories, and a macadamized road were features.

Mounting the rise over the township of Kingscote, a lovely evening view presented itself. Nepean Bay lay stretched out below, blue and placid, and far out the little steamer was moving landward. It was not long before we were comfortably lodged in the Ozone Hotel.

Exchange.—Mr. E. D. Barnard, R.A.O.U., Kurrajong, *via* Gladstone, Queensland, is anxious to add to his oological collection the eggs of migrants and foreign *Accipitres*.

* According to the law of priority, which Mr. Mathews has apparently overlooked in this instance, likewise in the case of the Island *Meliornis novæ-hollandiæ*, these birds were provisionally named *halmaturina*, in 1906, by Mr. A. G. Campbell—see *Emu*, vol. v., p. 140, fifth paragraph.—Eds.

Report on Mutton-Bird Rookeries, Cape Wollomai.

BY A. J. AND A. G. CAMPBELL, Ms.R.A.O.U.

EGGING SEASON.

WE were camped on the Mutton-Bird rookeries, Cape Wollomai, from the 27th November to 4th December, 1912. Eggers were found far more numerous than on years of previous observations. On Sunday, 1st December, there were probably 200 persons on the rookeries, but many were merely sight-seers.

Towards the end of our stay many bird-burrows in different parts of the rookeries were examined and found to be empty—*i.e.*, birds had departed on account of their eggs having been taken. The important question is, Are these burrows tenanted again and eggs laid by the robbed bird or others? This can only be proved by some observers examining the rookeries again, say, about the end of December, or later. If the burrows are not again occupied, then, it is believed, the birds are greatly interfered with through excessive egging.

Again, there appeared to be no "glut" this season. (Hundreds of eggs are usually deposited upon the surface of the ground, through lack of unoccupied burrows.) This may have been caused by the great raiding during last (1911) season, when the number of eggers (owing chiefly to increased local population) was greatly increased, compared with former years, and last egging season was the heaviest known. The planting of marram grass has been successful in places, but the efforts to stay the largest sand-dunes have failed so far, the sand having moved much towards the rookeries since observations were last made. The fences placed to keep out sheep should have plain wire on the topmost rows, for the barbed wire now there is responsible for the entanglement and death of numerous birds.

Owing to the scientific interest and economic value of these Petrels (Mutton-Birds), they should be protected—at all events partially—by limiting the raiding by eggers during November, and especially birding in autumn. Referring to the previous reports and recommendations in *The Emu* (*vide* vol. ii., p. 195, and vol. viii., pp. 209-10, the following proposals are again suggested to the authorities:—

(1) That campers pay a nominal fee, as do those on the shores of Port Phillip Bay, or that a small toll per dozen be levied on eggs (or birds) collected.

(2) That the names and addresses of all visitors to the Cape Wollomai rookeries be registered, and, for statistical purposes, the numbers of eggs taken. (This plan was adopted as an experiment by Mr. C. W. Maclean, C.E., then Chief Inspector of Fisheries and Game, during the season of 1902, and worked well. Eggers and visitors registered their names at either Cowes or San Remo. The fact of having to register one's name appeared to keep away the "rough element"—persons who occasionally visit the rookeries "for sport.")

(3) That opening-up of burrows by removing earth or scrub be not permitted, as it causes sand-drift. If an egg cannot be withdrawn by ordinary egg-hook the burrow should be left intact.

(4) That no dogs be permitted on the rookeries (Dogs are a great nuisance in more ways than one.)

(5) That eggng operations cease positively on the last day of November each season. (It has been found that, after the date mentioned, about 50 per cent. of eggs collected show signs of incubation, and are commercially worthless.)

(6) That the planting of marram grass be continued, especially on the "reserve" at the neck of the cape. (A good object-lesson in what might be done to prevent sand-drift is afforded on Mr. Cleeland's property, where marram grass planted four years ago is now well established. The major part of the reserve (over 200 acres) consists of moving sand-dunes, and these should be vigorously attacked by plantations of marram grass, particularly on the eastern fringe.)

BIRDING SEASON.*

We spent five days (23rd to 27th March, 1913) on the Cape Wollomai rookeries. The weather generally was unpropitious, but we were enabled between times to make ample observations regarding the state of the rookeries. The young birds were hardly grown enough for taking, but there was one party (four persons) camped, fishing, shooting, &c., which took away about 50 birds. A local fisherman also took a few.

There is no doubt that the whole of the Cape rookeries appear in a badly depleted state, presumably from over-raiding of recent years, capped by the last two seasons' great gatherings, including the heavy birding in April, 1912. Usually at the end of the eggng season it is stated that, notwithstanding the amount of eggng, a glut occurs—*i.e.*, numbers of eggs are deposited on the surface of the ground, under bushes, &c., there being no burrows to accommodate them. We were careful to remain till the end of last season (4th December), but no such glut occurred. This was the first observation that aroused our suspicion regarding the welfare of the birds. A second suspicion occurred this visit, after taking up our usual position to view the incoming birds at evening, when it was observed their numbers had greatly decreased. After all eggng had departed from the rookeries last November, we carefully surveyed the whole area of the Cape, testing burrows here and there, and found the majority empty through eggng, and we particularly noted patches entirely devoid of birds.

It is popularly stated that Mutton-Birds return the same season to lay again, if robbed, or other birds take their place.

* This part of the report has been forwarded to Major Semmens, Chief Inspector of Fisheries and Game, Victoria, at his request.

This, we have proved to our satisfaction, is utterly incorrect, so far, at least, as the Cape rookeries are concerned. We had exceptionally good opportunities for examining the rookeries this birding season. First, recent showers of rain had obliterated all old marks, therefore the fresh tracks in and out of the burrows made by the parents going to feed their young were easily seen, and showed the burrows occupied. Second, early autumnal rains had caused a fresh growth of grass and weeds at the entrance of many burrows, therefore the empty ones could easily be detected. A methodical count proved that approximately 62 per cent. of the burrows were unoccupied, and were egged last season. Thus, our suspicions beforementioned were fully confirmed.

The following are the details of our counts :—

DETAILS OF COUNTS OF BURROWS * ON CAPE WOOLAMAI.

I.—From Red Point to main headland of Cape—

| | | Occupied. | Empty. |
|-----------|--|-----------|--------|
| <i>a.</i> | Open, bare ground near Banksia trees ... | 22 | 78 |
| <i>b.</i> | Another, ditto ... | 27 | 73 |
| <i>c.</i> | Sword-grass sand-hill adjacent .. | 53 | 47 |
| <i>d.</i> | Ditto, not so dense ... | 40 | 60 |

II.—On headland itself—

| | | | |
|-----------|-------------------------------|----|----|
| <i>a.</i> | Open patch north slope ... | 29 | 71 |
| <i>b.</i> | Another (old thistle bed) ... | 26 | 74 |
| <i>c.</i> | Open patch south side ... | 18 | 82 |
| <i>d.</i> | Among Scirpus tussocks ... | 36 | 64 |
| <i>e.</i> | Ditto ... | 33 | 67 |
| <i>f.</i> | Among Aster scrub ... | 57 | 43 |

III.—In large marram area fenced in (south coast)—

| | | | |
|-----------|------------------------------------|----|----|
| <i>a.</i> | Pigface rookery ... | 13 | 87 |
| <i>b.</i> | Ice-plant rookery opposite ... | 23 | 77 |
| <i>c.</i> | Another of same ... | 14 | 86 |
| <i>d.</i> | Tussocky brow of cliffs ... | 9 | 91 |
| <i>e.</i> | Another ... | 11 | 89 |
| <i>f.</i> | Among grassy hills with scrub ... | 74 | 26 |
| <i>g.</i> | Ditto, near fence ... | 56 | 44 |
| <i>h.</i> | Another ... | 51 | 49 |
| <i>i.</i> | Scrub at head of Pigface Creek ... | 62 | 38 |
| <i>j.</i> | Another, ditto ... | 58 | 42 |

IV.—West end of rookery on south coast—

| | | | |
|-----------|----------------------------|-----|-------|
| <i>a.</i> | Open ground ... | 22 | 78 |
| <i>b.</i> | Among sword-grass ... | 59 | 41 |
| <i>c.</i> | Very thick sword-grass ... | 91 | 9 |
| | | 884 | 1,416 |

Of total of 2,300 burrows examined 38.4 per cent. only were occupied.

*The number of burrows to the square chain is 260. This average was obtained by six counts of separate plots each a chain square, selected in different but typical portions of the rookeries. Presuming that there were 200 acres of rookeries, in a full laying season there should be about 1,040,000 birds.

From the table it will be observed that in Area III. (*d* and *e*) the percentage of birds is small. This is a favourite rookery, open ground and easily raided, while in areas with scrub and sword-grass—notably Area IV. (*c*)—the percentage of birds is high, owing to the difficulty of roots and crooked burrows impeding eggers' hooks.

In view of the serious depletion of the Cape rookeries, it might be recommended (with the sanction of the part owner of the land) that that portion of the Cape headland enclosed by Mr. Cleeland's most southern barbed-wire paddock be strictly prohibited next season from both egging and birding. This area contains approximately 75 acres, and includes the favourite pigface (*Mesembrianthemum*) rookery, which is most easily raided, and, in consequence, the one we found most depleted.

Possibly the public would not object to any moderate restriction in favour of the birds, *their own sport and profit*. The birds require a rest. Egging has been carried on uninterruptedly, more or less, for the last 40 years. Another and a better recommendation would be to prohibit egging and birding every alternate year until the birds reassert their former numbers.

Notes on a Small Collection of Bird-Skins from the Northern Territory.

By A. J. CAMPBELL AND J. A. KERSHAW, Ms. R.A.O.U.

THROUGH the courtesy of Mr. Atlee Hunt, C.M.G., Secretary Department of External Affairs, there has been placed at the disposal of the Royal Australasian Ornithologists' Union a small collection of bird-skins for examination, and, for publication, the whole of Mr. G. F. Hill's ornithological field notes obtained during the Barclay Exploring Expedition through the Northern Territory. The Council of the Union deputed us to examine the birds, while Mr. Hill's field notes appear *in extenso*, beginning at p. 238.

The collection of skins (a few being in spirits) is small but interesting. There are 65 specimens, representing about 36 species. *Xerophila castaneiventris*, Milligan (Chestnut-bellied Whiteface) is new for the Northern Territory, likewise *Malurus coronatus*, Gould (Purple-crowned Wren). A female only of the latter was obtained, which appears darker in general colouration than Gould's figure ("Birds of Australia," Suppl., pl. 20).

The bird of most interest is a Grass-Wren new to science, which we have named *Anytornis rufa*. The following is its description:—

Adult Male.—Upper surface rich rufous, each feather from head to mantle, including upper wing coverts, having a white central stripe; line of black from gape, extending backward about half an inch; ear coverts dark, striped with white; throat whitish; rest of under surface buffy, darkest on flanks, which

are light rufous; wings and tail blackish-brown, some of the feathers of both edged with rufous. Iris light brown, tarsus horn-coloured, bill greyish (Hill).

Dimensions in inches:—Length $6\frac{1}{2}$, wing $2\frac{6}{16}$, tail $3\frac{1}{2}$, tarsus $\frac{7}{8}$, culmen $\frac{7}{16}$.

Type.—At National Museum, Melbourne.

Subjoined is a full list of the collection:—

TABULATED STATEMENT OF BIRDS COLLECTED IN NORTHERN TERRITORY.

| No. | Name. | Date. | Locality. | Field Notes (Hill's).* |
|-----|--|---------------------|---|---|
| — | <i>Podiceps poliocephalus</i> , ♂ | 11/6/11 | Arragoona Water-hole, Lander Creek, at C. III. | Gape yellow, iris yellow, feet greenish-horn, bill yellowish-horn. |
| 54 | <i>Anas gibberifrons</i> , ♀ | 24/11/11 | Borroloola. | |
| — | <i>Nycticorax caledonicus</i> , ♂ | 17/9/11 | Macarthur River. | Iris orange, feet green, bill green. |
| — | <i>Ibis molucca</i> , ♀ | 20/9/11 | Carrington Landing, Macarthur R. | Iris umber, feet purple, bill black. |
| 30a | <i>Sterna anæstha</i> , ♀ | 20/10/11 | Observation Island, Gulf of Carpentaria. | Iris umber, feet black, bill black. |
| — | <i>Charadrius</i> ♀ "dominicus", ♀ | 26/9/11 | Borroloola. " | Iris dark " brown, feet greyish-yellow, bill black; t.l. 233 mm., w. 140, t. 42, b. 22, tail 70. |
| — | <i>Haliaëtus leucogaster</i> (sex ?) | 22/10/11 | Near mouth of Macarthur R., Gulf of Carpentaria. | Iris greyish-brown. |
| 22 | <i>Falco lunulatus</i> , ♀ | 27/5/11 | Meyer's Camp, near Haast's Bluff, Macdonnell Ranges, N.T. | |
| 50 | <i>Corvus coronoides</i> (sex ?) | 21/11/11 | Borroloola. | |
| 5 | <i>Gymnorhina tibicen</i> , ♂ | 15/4/11 | Alice Springs. | Iris brown, feet black, bill black. |
| 58 | " " ♀ | 3/2/12 | Five-Mile Bar, Macarthur River. | Iris brown, feet blackish; bill slate-blue, black tips; t.l. 393, w. 238, t. 51, b. 54, tail 135. |
| 53 | " " ♀ <i>Gymnorhina tibicen</i> (?) | 24/11/11 28/1/12 | Borroloola. Five-Mile Bar, Macarthur River. | Iris sienna, feet black; bill white, black tips; t.l. 427, w. 277, t. 50, b. 64, tail 140. |

* Where details are not supplied in this column see body of Mr. Hill's article.

| No. | Name. | Date. | Locality. | Field Notes (Hill's).* |
|-----|------------------------------------|---------|---------------------|---------------------------|
| — | <i>Cracticus nigrigularis</i> , | 28/1/12 | Five-Mile Bar, Mac- | |
| | " " ♂ | 28/1/12 | arthur River. | |
| — | <i>Trichoglossus</i> " rubri- | 17/9/11 | Borroloola. | Iris orange, feet |
| | torques, ♂ | | | grey, bill red. |
| — | " " ♂ | 15/9/11 | " | " |
| — | " " ♀ | 16/9/11 | " | Iris reddish-brown, |
| | | | | feet grey, bill red. |
| 3 | <i>Lophophaps leucogaster</i> , | 13/4/11 | Alice Springs. | |
| | ♂ | | | |
| 16 | " " ♀ | 23/5/11 | Near Haast's Bluff, | |
| | | | Macdonnell | |
| | | | Ranges. | |
| 6 | <i>Ocyphaps lophotes</i> , ♀ | 16/4/11 | Alice Springs. | |
| 59 | <i>Eudynamis cyano-</i> | 3/2/12 | Five-Mile Bar, Mac- | Iris red, feet grey, |
| | cephala, ♂ | | arthur River. | bill grey. |
| — | <i>Oriolus affinis</i> , ♂ | 30/9/11 | Borroloola. | Iris red, feet dark |
| | | | | grey, bill brown- |
| | | | | ish-horn. |
| | <i>Chlamydodera nuchalis</i> , | 17/9/11 | Macarthur River. | Iris amber, feet |
| | ♂ | | | greenish - horn, |
| | | | | bill horn. |
| | <i>Philemon sordidus</i> , ♂ | 30/9/11 | Borroloola. | Iris amber, feet |
| | | | | dark grey, bill |
| | | | | black. |
| | " " ♂ | 30/9/11 | " | " |
| 1 | <i>Climacteris superciliosus</i> , | 12/4/11 | Undoolya Station, | |
| | ♀ | | Alice Springs. | |
| 2 | " " (? ♂) | 12/4/11 | Emily Gap, Alice | |
| | | | Spring. | |
| 8 | <i>Amytornis textilis</i> , ♀ | 1/5/11 | Simpson's Gap, | Iris light amber, |
| | | | Macdonnell | feet light horn, |
| | | | Ranges; rocky | bill light horn; |
| | | | slopes about | t.l. 165, w. 59. |
| | | | 2,500 feet; spini- | t. 24, b. 12, |
| | | | fix grass. | tail 83. |
| 7 | " " ♂ | 1/5/11 | " | Iris light amber, |
| | | | | feet light horn, |
| | | | | bill light horn; |
| | | | | t.l. 177, w. 59, |
| | | | | t. 24, b. 13, |
| | | | | tail 85. |
| 52 | <i>Amytornis rufa</i> (type), | 3/7/11 | Lat. 19° 27", about | Iris light brown, |
| | ♂ | | 160 miles north | feet horn, bill |
| | | | of N.T. Survey | greyish; t.l. 158, |
| | | | Camp C. IV. | w. 57, t. 22, b. —, |
| | | | | tail 90. |
| 37 | " " (co-type) | 2/6/11 | Lander Creek. | " |
| | | | (Spirit specimen; | |
| | | | some of notes | |
| | | | obliterated. — J. | |
| | | | A. K.) | |
| 27 | <i>Artamus melanops</i> , ♀ | 4/6/11 | Commonwealth | |
| | | | N.T. Survey | |
| | | | Camp C. 2. | |

* Where details are not supplied in this column see body of Mr. Hill's article.

| No. | Name. | Date. | Locality. | Field Notes (Hill's).* |
|---------|--|-------------------|---|--|
| 20 | <i>Petræca picata</i> , ♀ | 26/5/11 | Near Haast's Bluff, Macdonnell Ranges. | |
| — | <i>Pœcilodryas cervini-ventris</i> (? ♂) | 2/10/11 | 2 miles N.N.W. of Borroloola. | |
| — | " " ♀ | 2/10/11 | 2 miles N. of Borroloola. Several bones show signs of injury in youth | |
| 24 | <i>Glycyphila albifrons</i> , ♂ | 3/6/11 | Commonwealth Camp C. 2. | |
| 23 9 | <i>Ptilotis heartlandi</i> , ♂ | 3/6/11 18/5/11 | " Haast's Bluff, Macdonnell Ranges. | |
| — | " " ♂ | — | (One pair only seen at foot of quartzite range.) | |
| 25 | " " ♀ | 3/6/11 | Commonwealth Camp C. 2. | |
| — | " " ♀ | — | (From spirits; no particulars. — J. A. K.) | |
| — | <i>Ptilotis sonora</i> , ♂ | 26/5/11 | Near Haast's Bluff, Macdonnell Ranges. | Iris dark amber, feet grey, bill black, gape yellow. |
| 4 | <i>Ephthianura aurifrons</i> , ♀ | 14/4/11 | Alice Springs. | Iris red-brown, feet dark horn; bill light horn at base, black tips. |
| 21 | <i>Xerophila castanei-ventris</i> , ♀ | 27/5/11 | Meyer's Camp, near Haast's Bluff, Macdonnell Ranges. | |
| 30 | <i>Smicrornis flavescens</i> , ♀ | 12/6/11 | N.T. Survey Camp C. III., Lander Creek. | Iris white, feet dark horn, bill dark horn. |
| 10 | <i>Acanthiza uropygialis</i> , (♂ ?) | 19/5/11 | Mt. Francis, Macdonnell Ranges. | |
| — | <i>Pardalotus</i> , sp., ♀ | — | (No label; out of spirits; poor specimen. — J. A. K.) | |
| — | <i>Mivafra horsfieldi</i> | 27/2/12 | Borroloola. (Spirit specimen. — J. A. K.) | |
| — | " " | — | (No label; spirit specimen. — J. A. K.) | |
| — | " " | — | " | |
| — | <i>Mahurus assimilis</i> , ♂ | 16/2/12 | Sandstone ranges 10 miles S. of Borroloola. | |

* Where details are not supplied in this column see body of Mr. Hill's article.

| No. | Name. | Date. | Locality. | Field Notes (Hill's).* |
|-----|---|---------|--|---------------------------|
| 34 | <i>Malurus assimilis</i> , ♂ | 4/7/11 | 179 miles N. of N.T. Survey Camp C. IV. | |
| — | „ „ ♀ | 16/2/12 | Sandstone ranges 10 miles S. of Borrooloola. | |
| 29 | <i>Malurus</i> , ? sp. (im- mature), ♂ | 12/6/11 | N.T. Survey Camp C. III., Lander Creek. | |
| 26 | <i>Malurus</i> , ? sp. (im- mature), ♂ | 4/6/11 | N.T. Survey Camp C. 2. | |
| — | <i>Malurus coronatus</i> | — | (No label; out of spirits.—J. A. K.) | |
| 19 | <i>Emblema picta</i> , ♂ | 24/5/11 | Near Haast's Bluff, Macdonnell Ranges. | |
| 17 | „ „ ♂ | 23/5/11 | „ „ | |
| 13 | „ „ ♂ | 21/5/11 | Haast's Bluff. | |
| 18 | „ „ ♂ | 24/5/11 | „ „ | |

* Where details are not supplied in this column see body of Mr. Hill's article.

Stray Feathers.

White-shouldered Caterpillar-eater (*Lalage tricolor*).—About the middle of last November I received from Mr. Reg. Slater, of Kelso, West Tamar, a bird which he had shot, and which was new to him, I quickly identified it as a male of the above species, and of particular interest because it was but the second bird to my knowledge taken in the island. Although prior to it being obtained there had not been any heavy gales, without a doubt it had been blown across from the mainland.—FRANK M. LITTLER. Launceston, 11/2/13.

* * *

Ewing Tit (*Acanthiza ewingi*).—I was much interested in reading the account of the birds observed during the recent trip of the Union to Cape Barren and Flinders Islands. A statement with reference to Ewing's Tit somewhat surprised me. I refer to the sentence—"Like Tasmania, Flinders Island abounds with this Tit." I have a very fair knowledge of the ornithology of Tasmania, and must refute the statement that *A. ewingi* "abounds." If the specific name *ewingi* be replaced by *diemenensis*, then the latter bird certainly does "abound." I should much like to know whether a slip was made in the report, as far as Flinders Island is concerned, or whether the *Acanthiza* said to "abound" was definitely identified as *A. ewingi*.—FRANK M. LITTLER. Launceston, 11/2/13.

Gulls Nesting in Captivity.—In December, 1909, when returning from Port Lincoln, I was presented with a pair of Seagulls (white, with slate-coloured backs and black-tipped feathers in the wings). These birds were only “squeakers” then, and had to be fed on raw meat daily, but gradually began to forage for grubs, &c., in my garden at Kensington Park, and now do not require to be fed at all. As they grew older they made nests in different parts of the garden, and sat at times like broody fowls for several weeks, but did not lay until the 17th July, 1912, when one egg was laid; a second egg was laid two days later. The first young one appeared on 7th August, but the second egg was hatched at least three days later. These two young birds are now fully fledged, but have a large number of brown feathers on the back. The old pair again started nesting in November, the first egg appearing on the 12th, the second four days later. Two young birds appeared on the 8th December. The old birds, taking turn and turn about, sat very closely all the time. These young ones are now running about, but are shy, and hide in the grass when anybody approaches. The nest was made of grass and feathers against a wire-netted fowl-run, backed up by some broken garden tiles. The greater part of my land is used for gardening purposes, and I have never found the birds do any damage to the young plants or be a nuisance. They will now eat almost anything, but object to hard-shelled snails, although they eat them at times if the shells are broken. I find these birds make good “watch-dogs,” as they always call out when any stranger goes into the garden.—HARRY F. KING. Adelaide, 25/12/12.

* * *

Silver Gull (*Larus novæ-hollandiæ*).—Mr. G. M. Mathews in his work, “The Birds of Australia,” is setting ornithological field workers many problems, which it is hoped will be faced by R.A.O.U. workers. In part 4, vol. ii., our familiar Silver Gull is placed in the genus *Bruchigavia* of Bonaparte (1857). The genus *Larus* of Stephens dates from 1826, so that I cannot understand why Mr. Mathews has, to my mind wilfully and unreasonably, abandoned his fetish of priority. He divides the old and well-known species into five—a type and four sub-species. Those birds found round the coasts of New South Wales and Victoria are taken as the type under the cognomen of *Bruchigavia novæ-hollandiæ novæ-hollandiæ*; those round the north coast, and as far south on the eastern side as the Capricorn group as *B. n. gouldi*, while those found in Bass Strait and about Tasmania are designated *B. n. gunni*; the South Australian birds are called *B. n. ethalæ*; and lastly those found about the south-west and the north-west are set down as *B. n. longirostris*. To a great extent the variation in the markings on the four first primaries has been taken as the grounds for separating the birds.

Full size black and white drawings of the primaries of the four birds first mentioned are given by Mr. Mathews, and these show a marked difference in the “mirrors.” I give the foregoing

somewhat lengthy explanation for fear there may be some interested member who has not access to Mr. Mathews' work. The two species I am most interested in are *B. n. novæ-hollandiæ* and *B. n. gunni*. This note is intended to be but a brief record of preliminary observations that I have made with a view to investigating the validity or otherwise of the two birds now ranked as a species and a sub-species respectively to remain as such. I have been able to examine a small series of skins of birds taken off the northern coast of Tasmania, and also actual live birds captured when young on different islands in Bass Strait. According to the illustrations, *B. n. gunni* shows much more white than *B. n. novæ-hollandiæ*, the 3rd and 4th primaries being almost wholly white. Broadly speaking, my preliminary survey shows that some birds closely resemble *gunni*, while others approximate to *novæ-hollandiæ*, while again there are individuals that are partially one and partially the other. I refrain, for obvious reasons, from detailing the result of my observations at this stage. I hope at a later date to have something definite to communicate on the, to me, interesting question. Mr. Mathews suggests that perhaps the Tasmanian skins he handled were from the Great Lake. I have not yet examined skins from that locality, so cannot comment on them.—FRANK M. LITTLER. Launceston, 3/13/13.

* * *

Cuckoo Notes.—During the last four months of 1912 Cuckoos were very numerous throughout Victoria, and from all quarters came the monotonous and melancholy calls of the different species. North of Lake Tyrrell, in the Mallee country, in September, Messrs. F. E. Howe, T. H. Tregellas, and I noticed the Pallid (*Cuculus pallidus*), Fan-tailed (*Cacomantis flabelliformis*), Bronze (*Chalcococcyx plagosus*), Narrow-billed Bronze (*C. basalis*), and Black-eared (*Mesocalinus palliolatus*) Cuckoos, and saw an egg of the Fan-tailed species in a nest of the Chestnut-rumped Ground-Wren (*Hylacola pyrrhopygia*), and eggs of the Narrow-billed Bronze-Cuckoo in nests of the Chestnut-rumped Ground-Wren and Tawny-crowned Honey-eater (*Glycyphila fulvifrons*). At Ringwood most of my excursions were in company with Messrs. Howe and A. C. Stone. We observed that of the above-mentioned species of Cuckoos only the Black-eared was missing, but the Square-tailed (*C. variolosus*) was there in addition. Throughout October and November it was an unusual thing to find a nest of certain species of birds which did not contain a Cuckoo's egg. For the first time during an experience extending over several years, I found eggs of the Square-tailed Cuckoo. Almost every nest of the Scarlet-breasted Robin (*Petroica leggii*) contained an egg of the Square-tailed Cuckoo or of the Narrow-billed Bronze-Cuckoo. Five cases of the former were recorded, and the same number of the latter. In the cases of the Square-tailed Cuckoo, one nest held an egg of the Robin, another two eggs of the Robin, a third three eggs of the Robin, and a fourth two young Robins;

while in the last case the egg of the Cuckoo had been placed in the nest before building was complete, and had been covered with the lining. Two eggs were found in a nest of the Little Field-Lark (*Chthonicola sagittata*), one belonging to the Lark and the other to a Narrow-billed Bronze-Cuckoo, and the last-mentioned species also deposited eggs in nests of the Blue Wren (*Malurus cyaneus*), three cases being noticed. One Sunday we watched a Brown Flycatcher (*Microeca fascians*) building its nest. A week later the nest contained an egg of the Pallid Cuckoo, which had been broken, probably by the Flycatchers. The Bronze-Cuckoos favoured the Tits—*Acanthiza chrysorrhoa*, *A. lineata*, and *A. pusilla*. On three separate occasions we found two eggs of the Bronze-Cuckoo in a nest of the Yellow-rumped Tit, and in one instance we discovered a nest of the Brown Tit containing three eggs—one of the Tit, one of the Fan-tailed Cuckoo, and one of the Bronze-Cuckoo. That we are able to record four cases in each of which two Cuckoos' eggs were in the same nest is, I think, abundant evidence that the Cuckoos, lately, have been far more numerous than usual.—J. A. Ross. Melbourne.

* * *

Megapode Mounds and Pits.—During several years the intense industry of the Scrub-Fowl (*Megapodius tumulus*) has afforded continual entertainment. Of course, this sturdy dweller of the jungle scratches that he may live, and makes mounds of leaves and decaying wood and loam because the genius of the species dictates a method of incubation “ages ahead of the fashion” of less brainy birds. Given the inevitable duty of scratching for its food, and the brilliant idea of utilizing chemical heat rather than the heat of its own body for the hatching of its eggs, and the toil such a scheme involves, still there remains to the bird the credit of remarkable achievements, which from the human standpoint have little to do with either the obtaining of food or obedience to the second law of nature.

The bird has developed such pedal capability and such mental artfulness that the construction of mounds appears to be a mere pastime. It may, therefore, indulge in merely fanciful operations, to play with the materials it uses for the most serious of its functions, and chuckle contentedly while it plays.

As is well known, the Scrub-Fowl seldom leaves mother earth, and then only on short, bustling, laboured flights. Its diet, generally, is not of things of the air and light, but of the moist earth of the dim-lit jungle. Grubs, beetles, worms, the pupæ of ants, young snakes, centipedes, millepedes, scorpions, and other creatures for which the average man has no particular liking, are eagerly devoured. The search for such food involves the shifting of much of the rubbish of the jungle floor, so that you may come across wide spaces over which the roots of trees have been laid bare and the stones and decaying wood tossed aside.

Almost without exception the incubating mounds are located in

shady and obscure places, and are used by several birds in community. Occasionally single birds will in an outburst of superfluous energy, construct the foundations of a mound in quite an unlikely locality. Several such ill-considered enterprises have been undertaken in this locality. One which was noticed a few days ago is singular. The bird has selected a very old mound, originally in the jungle, but which has been exposed on the edge of a clearing for the last fifteen years. The apex of this mound, which time and ballistic rains have converted into solid loam, has been excavated, and rubbish from the jungle is being daily heaped up, the tracks along which the stuff is kicked being as well defined as a garden path.

One of the enemies of the Scrub-Fowl is the Grey Goshawk, but since (in the interests of domestic poultry) that bold and rapacious bird is driven off as soon as the Spangled Drongo fussily proclaims its hateful presence, the Scrub-Fowls of the jungle have ventured on to the sandy flat, where there is a fair amount of shade, and being reluctant to fly back to the jungle when in the egg-laying mood, meet Nature half-way. Digging is easy in the sand, and in the spots favoured by the birds are many shallow pits, which they have excavated in search of food. The addition of a few leaves converts the pit into an ideal nesting-place, in which the egg is laid. The blacks know the nest of the solitary Scrub-Fowl by the name of "boon-nun-gun." Often the "boon-nun-gun" is merely a pit 6 or 8 inches deep, and the egg, having been covered with leaves, is left to Providence's care. The blacks readily detect the "boon-nun-gun," and, exercising the prerogative of Providence, appropriate the big pink egg. On occasions the "boon-nun-gun" is really the beginning of a mound, and the bird may give a demonstration sometimes of the way in which the heaps of earth, sand, and vegetable matter accumulated. The material is scratched into three or four converging ramps, which are gradually worked to a common centre. Usually the structure of the ramps is anything but true, while I have seen them so regular in spacing and height that they would have done credit to a man with a rake. Though much apparent labour is required in the building of these ramps in the forest country, the superstructure is never, in my experience, completed. The birds sooner or later submit to the preconceptions of the species for the dimness and seclusion of the jungle, and repair thither for the formal fulfilment of Nature's decree. There can be little doubt that occasionally the egg deposited in a "boon-nun-gun" is hatched, in which event the chick would have just as good a start in life as if its cradle had been in the deep shade.

The laying of superfluous eggs is not strictly confined to the industrious and thoughtful Scrub-Fowl. Darwin mentions the single and scattered eggs of Ostriches* at Bahía Blanca. South America, which, he says, are never hatched out, and which are

* ? Rheas.—Eds.

called by the Spaniards "huachos." The Ostrich is considered by human beings to be a silly bird, while the Scrub-Fowl is to be honoured because of uncommon sagacity. Probably the species discovered artificial incubation, and even in idle moments may spend time in the making of an ineffectual mound. The Ostrich, with rare thriftlessness, abandons needless eggs with simpering indifference to the cheap sneers of mankind.

There is one mound of the more intelligent bird which was in use when "Tom" (an aborigine) was a boy, and he passed away at the age of about 40. It is still in splendid working order, though it lies within arm's reach from high water mark. It is on the very verge of the jungle, which at the spot overhangs the tide. Other mounds have been made, and have been used for years, and have passed into forgetfulness; but that from which "Tom's" grandfather got eggs when he was a boy—that is to say, if the legends of the camp are to be credited—still produces young Scrub-Fowls by the score every year. The "boon-nun-guns" are but temporary phases of the activities of the entertaining bird, which chuckles and crows with shocking discordances and whimpers in that high interrogative falsetto which is one of the singularities of the language of the Chinese.—E. J. BANFIELD. Dunk Island, North Queensland.

From Magazines, &c.

Breeding Wild Ducks.—In *The Outing Magazine* for November and December, 1912, appear two interesting articles by Mr. Herbert K. Job, State Ornithologist of Connecticut, United States of America. In one article the author relates how he hunted for Ducks' eggs in the marshes of Lake Manitoba, and in the other he deals with the hatching, rearing, and transporting of Ducklings. Mr. Job organized a Government expedition to the Canadian North-West last year, "the purpose being to bring back eggs or young of as many species of Wild Ducks as possible, to study methods of feeding, rearing, and breeding, and to give the results to the public in bulletins of the Storrs Agricultural Experiment Station." The expedition set out in June, 1912, for the immense marshes at the southern end of Lake Manitoba. Twelve species of Ducks were found breeding among the marshes, and eggs or young of each were secured by the members of the expedition. The eggs were hatched in an incubator. On the 2,000-mile journey back Mr. Job attended the consignment personally in the express railway cars, and he landed all but a few of the Ducklings safe at their destination. The work of hunting for Ducks' nests in the lonely marshes was full of interest, and Mr. Job and his helpers had many experiences, which all other ornithologists who hear of them must envy him. He obtained a series of photographs of nests and eggs and young birds, some of which illustrate his article.

The article which deals with the last phase of the expedition is

entitled "Wild Ducks from an Incubator." Remarkable results were obtained from the hatching experiments. One clutch of thirteen eggs was carried in a boat all one afternoon before being set under a hen for the night, and driven for a day over rough prairie trails. Every one of the eggs hatched, and 11 of the ducklings reached maturity. Many other clutches of eggs were placed in the incubator, with gratifying results. The ducklings were kept in the machine for from 24 to 36 hours after hatching. The average hatch for the season was 92 per cent., which is far better than the results obtained on poultry farms. The feeding of the broods gave the "Duck farmers" much anxiety. The main staple foods were raw oatmeal and a special Wild Duck meal. Hard-boiled egg, finely ground, shell and all, was found to be a desirable food, and the Ducklings were frequently taken out on the grass. After an adventurous journey 102 Ducklings, representing 11 species, were landed on the preserve. Eighteen birds had been lost during the journey, and a few weak birds died after arrival at their destination; the rest thrived. The author concludes his article thus:—

"It is a rare delight now to have this unique and beautiful stock within easy access, to study their early plumage and changes, as yet not all described in books, to note their interesting ways, and to work out details of handling, feeding, and breeding, under the auspices of a Government Experiment Station, where scientific work is understood and appreciated. If only experiments could thus have been made with the lamented Passenger-Pigeon, we should doubtless have had them alive to-day. We may well hope that from such beginnings these splendid wild-fowl species may be so widely multiplied that extermination will be impossible, and, better still, that, through public interest engendered in their welfare, they may again become familiar sights upon the waters of our entire country."

Review.

["The Home Life of the Terns." By W. Bickerton, M.B.O.U. Witherby and Co., London. Price 6s. net.]

THE fourth volume of the Bird-Lover's Home Life Series, which Messrs. Witherby and Co. are publishing, is as interesting as the earlier issues. The author deals with several species of the graceful sea-birds, which are favourites with so many ornithologists, and his descriptions of nesting-places, habits, and so forth make good reading. Five species of the Family of Terns visit the British Isles every summer for the nesting season, returning to southern climes in early autumn. All five birds belong to the genus *Sterna*. Mr. Bickerton modestly describes his book as "the simple holiday study—fragmentary rather than exhaustive—of an amateur naturalist who has found real delight and relaxation in trying to watch faithfully and to record

accurately, both with pen and camera, the doings of a little group of birds whose fascination to him has been supreme." "The Home Life of the Terns" is a book which deserves high praise. The 32 full-page plates, which are mounted on artistic brown paper, form a fine gallery of bird pictures. Some of the photographs show birds on or near the nest; others depict young birds and eggs. The most attractive studies are those of Arctic and Common Terns with their beautiful wings expanded. It is pleasing to read, in the chapter on the Sandwich Tern, that the whole area of the Ravenglass Gullery, Cumberland, where some of the photographs reproduced in the book were obtained, is now strictly maintained as a bird sanctuary. The plume-hunters are not allowed to plunder as they wish in every locality.

Bird Observers' Club.

THE monthly meeting of the Bird Observers' Club was held on Wednesday, 24th September, 1912, at the residence of Mr. G. A. Dyer, "Harpley," Barkly-street, North Fitzroy. In the absence of the president, Mr. J. A. Ross occupied the chair. The chairman welcomed Mr. R. Walton to the meeting. The revised rules of the Club were read, and, after a few minor alterations had been made, they were adopted. It was decided that each member should be supplied with a copy of the rules. Mr. F. E. Wilson read a paper entitled "Notes on Victorian Maluri." At the conclusion of the paper several members contributed interesting notes. Mr. C. P. Conigrave spoke of birds met with during his recent exploration trip in the north-west of Australia. Mr. Kershaw exhibited an interesting series of eggs collected during the voyage of the *Discovery* in the Antarctic seas between 1901 and 1904. The eggs were as follows:—King Penguin (*Aptenodytes patagonica*), Adelie Penguin (*Pygosceles adeliae*), Royal Penguin (*Catarrhactes schlegelii*), M'Cormick Skua (*Megalestris macormicki*), and Snowy Petrel (*Pelagodroma nivea*). Mr. F. E. Wilson exhibited skins of Maluri in illustration of his paper.

The monthly meeting of the Bird Observers' Club was held at the residence of Mr. O. W. Rosenhain, "Koala," Balaclava-road, East St. Kilda, on 13th November, 1912. Mr. A. H. E. Mattingley, C.M.Z.S., occupied the chair. Mr. L. G. Chandler, the hon. secretary, read a letter from Mr. H. Witherby, editor of *British Birds*, and exhibited samples of aluminium bird-rings forwarded from England. The chairman congratulated Dr. J. A. Leach, upon whom the degree of Doctor of Science was recently conferred. Dr. Leach, in responding, outlined the work which he had done in regard to the classification of birds. His thesis was entitled "The Morphology of the Strepera." The result of his work indicated that other systematists had placed this family in the wrong position. A letter was received from Mr. R. Godfrey regarding the destruction of bird-life in districts where poison was laid for rabbits. Mr. A. C. Stone said that he was satisfied that poison never eradicated rabbits. Mr. L. G. Chandler mentioned a case that had come under his notice, in which two valuable horses had been poisoned by bait laid for rabbits. The subject was discussed by several members, and it was decided that an effort be made to obtain the bodies of some poisoned birds. By analyzing the contents of the stomachs of specimens sent in the Club would be in a position to prove that the laying of poisoned baits for rabbits was inimical to bird-life. Mr. R. Walton was elected a member of the Club. The resignation of Mr. C. W. Wilson was received with regret. Mr. Wilson, in a letter, stated that pressure of business prevented him from

attending the meetings of the Club. Mr. T. H. Tregellas read a paper entitled "Our Mallee Trip." He described the many strange experiences of Messrs. J. A. Ross, F. E. Howe, and himself during a fortnight's holiday in the Mallee. Mr. O. W. Rosenhain gave an interesting account of his recent tour of the world. What he had seen in other lands had made him more firmly convinced than ever of the necessity for bird protection. Up to a few years ago one dealer in London had received annually over 400,000 skins of Humming-Birds. Mr. A. C. Stone reported that he had received some eggs from Lake Boga which he had been unable to identify. They were similar to the eggs of the Yellow Robin (*Eopsaltria australis*). He hoped to secure specimens of the bird. Mr. T. H. Tregellas mentioned that he had found in the season five nests of *Petrarca phanicea* in the Dandenong Ranges, Victoria. Interesting notes were contributed by Messrs. E. B. Nicholls, C. F. Cole, and others. Mr. O. W. Rosenhain exhibited photographs taken while on his trip, and the hon. secretary showed a series of photographs of the nests and eggs of some Mallee birds.

The last meeting of the Bird Observers' Club for 1912 was held at the Botanic Gardens on 18th December. The members were entertained at a Mutton-Bird egg tea by Messrs. A. J. Campbell and A. G. Campbell. Before the meal a brief inspection was made of the bird-life in the Gardens. Dr. H. W. Bryant, the president, occupied the chair at a short meeting held after tea. Mr. L. G. Chandler, hon. secretary, read a paper entitled "Bird-Life in the Kow Plains District, Victoria." The paper was discussed by several members. Mr. Keith Macmeikan was elected a member of the Club. It was decided to hold a camp-out on Mud Island during the second week in January. Mr. D. Le Souëf, C.M.Z.S., who had recently returned from the Northern Territory, read a copy of a letter which he had sent to the Minister for External Affairs. It referred to the destruction of bird-life in the Territory by bird-catchers. Five men were engaged in the trade, and one man came into Port Darwin with 600,000 birds, mostly Finches. Most of these birds died before reaching other lands. Mr. Le Souëf thought that all licences would be cancelled at the end of 1912, but permits to collect for scientific purposes would still be issued.

Notes and Notices.

Photos.—The editors of *The Emu* are indebted to Mr. W. G. Harvey, Mackay, Queensland, for exceedingly pretty photographs of the nests and eggs of White-browed Shrike-Robin (*Pacilodryas superciliosa*), White-shouldered Caterpillar-eater (*Lalage tricolor*) and Pied Caterpillar-eater (*L. leucomelæna*).

Cacomantis lineatus, Dodd.—In my description (*Emu*, XII., p. 165) I omitted the wing length. I hasten therefore to correct this omission, at the same time giving the other dimensions. Total length, 8 inches; wing, 4.5 inches; tail, 3.75 inches; bill, 0.5 inches.—ALAN P. DODD. Nelson, *via* Cairns (N.Q.)

Bower-Birds' Eggs.—At a recent meeting of the Bird Observers' Club, Melbourne, Mr. H. L. White, Belltrees, New South Wales, exhibited a very beautiful and interesting series of the eggs of the Spotted Bower-Bird (*Chlamydodera maculata*). They were procured in the north-western part of his State, where the birds

are numerous, but, unfortunately, are deemed a pest, and are destroyed by the settlers, on account of their habit of raiding the gardens, especially fruit. Out of twelve sets (pairs) of eggs about 50 per cent. have the fine, hair-like lines covering nearly the whole surface of the shell. About 25 per cent. have the smaller end comparatively free from markings, while in odd pairs the lines are short or smudgy. Others have the linear markings so thickly placed as to form a broad band round the upper quarter, and a single specimen has the markings altogether few, light, and fanciful, imparting to the egg a delicate appearance, as of a hand-painted piece of china.—A. J. C.

Birds of Dorré and Bernier Islands, W.A. The *Records of the Western Australian Museum and Art Gallery*, vol. i., part 2, contains an article by Mr. Otto Lipfert, entitled "A Visit to Bernier and Dorré Islands During August and September, 1910." The author also gives a list of the birds observed on the islands. He states:—

"The best time to visit Bernier and Dorré Islands is immediately after the rainy season, when the wild flowers are in full bloom. Parts of Dorré Island then resemble a brilliant flower garden; however, the blooms do not last long, for during October the sun scorches everything except the salt-bush and spinifex. There is little animal life; even the sea-birds are by no means abundant, and as the aborigines, for whose benefit these islands have been reserved, are to some extent dependent for food on the result of their success in hunting, the wallabies and bandicoots will soon become extinct. The nesting season of the Eagles and Ospreys was well advanced. On Dorré Island I located three nests of *Haliaeetus leucogaster*, the White-bellied Sea-Eagle. One contained eggs, and the other two fledglings, while there were ten or more nests of *Pandion leucocephalus*, the White-headed Osprey. Owing to the rocky nature of the country, the nests are difficult of access. One Sea-Eagle's nest found on the east coast contained two eggs. It was a very bulky structure, the diameter on the top being 183 cm., at base 240, height 52; the mould was only 65 wide by 12 deep. To reach the nest it was necessary to make a detour of at least a quarter of a mile to find a spot where one could climb down to the shore, about 40 feet below. Both eggs were slightly incubated. Two other nests of this Eagle which I found on 27th August contained young birds at least a fortnight old. On 20th August, during an excursion southwards, I found eight nests of the Osprey, of which several were old and deserted. It is more plentiful than the Sea-Eagle, for five of these fine birds were in sight at once. A nest visited on 7th August was on a projecting cliff, and contained three young—two about a fortnight old, and the other about a week. It measured across the top 141 cm., base 160 cm., mould 59 cm., depth of same 6 cm., height of nest 88 cm. Both parent birds and their young were secured. A remarkable find on this island was the nest with two young of

Uroaëtus audax, for, owing to the total absence of trees, it was built on the side of a hill to secure a good outlook. It was situated about 15 yards from the top of the hill, and 35 from the foot. Across the top the nest measured 196 cm., at bottom 244 cm., The height on the upper side, top, was 53 cm., and on the lower 260 cm. Besides Eagles, there were large colonies of Cormorants, Sea-Gulls, and Terns; these had quite finished their nesting. The breeding season of the smaller birds, *Malurus*, *Sericornis*, *Megalurus*, &c., had finished about the end of May. They were always to be found in family groups of two old and three or four young birds. These were not common, for one often tramped mile after mile without seeing a single bird. Bernier Island has the same desolate appearance as Dorré, perhaps even worse, as there are no flowers and the scrub is thicker. To travel a mile and a half per hour may be considered good work, and even that is very tiring. The animal life is nearly the same as on Dorré Island, with the exception of *Megalurus*, which is not to be found here, and the Eagles and Ospreys are not so numerous as on Dorré Island. I found only one nest of *Haliaeetus leucogaster* and four of *Pandion leucocephalus*. On the north end, Knock's Island, numbers of Terns, both *Sterna bergii* and *S. nereis*, had been breeding. The Cormorants had no breeding-place."

Protection of Animals in Dutch New Guinea.—On the 1st July, 1910, an Ordinance was issued by the Government (Indian State Paper, 1909, No. 497) for protecting wild life in Dutch New Guinea. This Ordinance has been in force since 1st January, 1912. The provisions of the Ordinance are as follows:—

Article 1.—It is prohibited to catch or to kill wild animals or birds, with the exception of such as the Governor-General may exclude from the provisions of this Ordinance. It is prohibited to be in possession of wild animals, living or dead, or to possess skins or parts thereof. Article 2.—It is prohibited to collect the eggs of wild birds, or to possess the eggs of same. It is prohibited to disturb or to destroy the nests. Article 3.—The Governor-General has the power to instruct the Governors of the several Provinces to repeal the prohibitions of Articles 1 and 2, or any part of them, but only for a limited time, and under such conditions that no animal or bird shall be exterminated. Article 4.—The Director of Agriculture is authorized to issue licences for hunting and catching animals or birds for scientific purposes. Article 5.—Articles 1 and 2 are not applicable to private houses or grounds. Article 6.—Any person who infringes this Ordinance will be punished as follows:—If a European, by a fine of 100 guilders, or by imprisonment; if a native, by hard labour at the Public Works. Article 7.—The animals, eggs, parts of animals, and the instruments used for their capture, will be confiscated by the officials. If the animals are found to be living they will be set free; if injured, they will be killed. The eggs and parts of animals thus confiscated must be destroyed. Article 8.—All officials of the Government, including

the "controleurs," the "post-honders," the "civile gezaghebbers," and the foresters are authorized to enforce the provisions of this Ordinance.

This Ordinance has been supplemented by a second, which came into force on 1st May, 1912, and the provisions of which are as follows:—

Article 1.—It is prohibited to hunt Birds of Paradise, Parrots, and Crowned Pigeons in Dutch New Guinea without a licence issued by the Governor of the Province Tidon. Article 2.—If any person is found hunting without a licence he will be punished as follows:—If a European, by a fine of 100 guilders, or eight days' imprisonment; if a native, by a fine of 100 guilders, or three months' hard labour at the Public Works. The birds, eggs, skins, and parts of birds found in the possession of offenders will be confiscated and destroyed. Article 3.—If any person, having a licence, infringes the conditions of same, such licence shall be forfeited. A licence must also be obtained for carrying a gun and two kilogrammes of gunpowder and shot. Skins of birds can be exported only by licence-holders; if any other person attempts to export them the skins will be confiscated and the offender punished.

Licences for carrying a gun will be given only for six months—1st April to 1st November. The guns must be handed to the Government officials on 1st November of each year, and remain in their custody till 1st April.

Correspondence.

THE LAUNCESTON SESSION MINUTES.

To the Editors of "The Emu."

DEAR SIRs,—I desire to correct the minutes of the Launceston session appearing in the last (January, 1913) part of *The Emu*, p. 145, so far as they relate to the presentation of the report of the Check-list Committee. The minutes state that I read the report—a statement which is correct so far as it goes. To be strictly accurate the minutes should have first stated that I was charged by the convener of the Committee, Mr. A. J. Campbell, with the presentation, on its behalf, of the report, and with the conduct and carriage of the report through the session.

Again, in regard to the "species register," the minutes are scarcely accurate when they record a statement by me that the register was a system modelled on Dewey's Universal Library System. In answer to a question by Dr. G. Horne, I said that the register was suggested by that of the American Ornithologists' Union, but that I had been informed by a friend, who had, at

my request, kindly revised the draft report, that the register resembled Dewey's system.—Yours faithfully,

ALEXR. WM. MILLIGAN.

105 William-street, Melbourne, 31/3/13.

[The editors regret the meagre report of the proceedings of the session, especially on such an historical occasion as the presentation of the Union's "Check-list." The omissions, &c., were owing to circumstances over which the editors had no control, and they thank Mr. Milligan for his corrections. However, with becoming modesty, Mr. Milligan makes no reference to a special vote of thanks which, the editors learn, was accorded to him at the session, and should have been previously recorded.—EDS.]

Editors' Note.

MEMBERS contributing notes or articles to *The Emu* are expected in future to use the nomenclature in accordance with the "Official Check-list." Contributors are also kindly invited, when practicable, to type-write their articles, and thus assist the editors (whose leisure or private time is exceedingly limited) in their purely honorary work.

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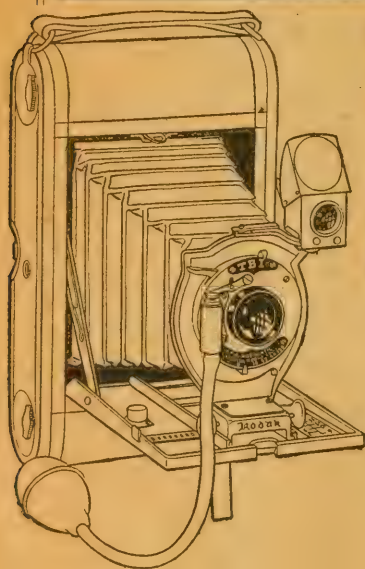
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